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THE NEW ENGLAND PEDIATRIC SOCIETY AND
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Volume 200, Number 19 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $7.56 | MAY 9, 1929 | Published Weekly in Boston at 126 Massachusetts Avenue

CONTENTS

The Emptying Time of the Kidney Pelvis. *Edward L. Peirson, Jr.* 959

THE NEW ENGLAND SURGICAL SOCIETY

The Operative Treatment of Varicose Veins, Varicose Ulcers and Phlebitis. *John Homans.* 965

The Injection Treatment of Varicose Veins. *E. Everett O'Neil* 972

The Spermatozoa Count. Its Value in the Diagnosis, Prognosis and Treatment of Sterility. *Donald Macomber* and *Morris B. Sanders.* 981

A Review of Three Hundred Consecutive Surgical Cases with Special Reference to Post-Operative Pulmonary Complications. *Horace K. Sowles* 984

Traumatic Subastragalar Arthropathy. *Denis S. O'Connor* 987

The Abuse of Drugs in Certain Psychopathic States—with Reports of a Few Cases. *Kenneth J. Tillotson* 990

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 15191—Vertical Headache. *Richard C. Cabot.* Case 15192—A Case of Implantation of Ureters into the Sigmoid for Extensive Rectovaginal and Vesicovaginal Fistulae. *Lincoln Davis* 994

EDITORIALS

Advertising 1000

Appointment of Dr. A. Warren Stearns 1000

The Complacence of the Antivaccinationist 1001

This Week's Issue 1001

(Contents continued on next page)

Medical Clinics of North America

SOUTHERN INTERURBAN CLINICAL CLUB NUMBER

Clinic of Dr. C. C. Bass, New Orleans, La.
Pellagra.
Clinic of Dr. E. Bates Block, Atlanta, Ga.
Dystrophia Adiposogenitalis with Disappearance of Testes.
Clinic of Dr. C. Sidney Burwell, Nashville, Tenn.
Three Types of Circulatory Failure.
Interpretation of Changes in Body Weight.
Clinic of Dr. C. L. Eshleman, New Orleans, La.
Some Types of Hypertension.
Clinic of Dr. Bryce W. Fontaine, Memphis, Tenn.
Tropical Sprue Endemic in Tennessee.
Clinic of Dr. Lewis M. Gaines, Atlanta, Ga.
Diagnostic Problems in Organic Neurology.
Clinic of Dr. George Herrmann, New Orleans, La.
Cardiothoracic Distress (Types). Differentiation and Treatment with Especial Reference to Sympathectomy.
Clinic of Dr. W. R. Houston, Augusta, Ga.
The Spasmogenic Aptitude.
Clinic of Dr. Chaille Jamison, New Orleans, La.
Pernicious Anemia.
Clinic of Dr. F. M. Johns, New Orleans, La.
Amebiasis Treatment with Iodo-oxy-quinolin Sulphonic Acid.
Clinic of Dr. Isaac Ivan Lemann, New Orleans, La.
Osteitis Fibrosa Cystica in an Infantile.
Bronchial Polyp Associated with Mediastinal Mass (Probably Mediastinal Lymphnodes); the Latter Causing Dysphagia.
Clinic of Dr. Randolph Lyons, New Orleans, La.
Report of a Case of Arteriosclerosis, Myocarditis, Pulsus Alternans, and Possible Coronary Occlusion; Value of Newer Diuretics in Cardiac Edema.
Clinic of Dr. Cabot Lull, Birmingham, Alabama.
Hemoptysis: Its Diagnostic Importance.
Clinic of Dr. James S. McLester, Birmingham, Alabama.
Thyroid Deficiency as a Cause of Poor Health.
Clinic of Dr. Hugh J. Morgan, Nashville, Tenn.
Induced Syphilitic Meningitis (Meningo-recurrences).
Clinic of Dr. John H. Musser, New Orleans, La.
Leukocytic Response to Throat Infections.
Clinic of Drs. J. E. Paullin and Harold M. Bowcock, Atlanta.
Glycosuria.
Clinic of Dr. Paul H. Ringer, Asheville, N. C.
Collapse Therapy in Pulmonary Tuberculosis.
Clinic of Dr. Stewart R. Roberts, Atlanta, Ga.
Neuropathic Dropsy of Right Forearm and Hand.
Acute Pellagra Associated with a Manic-depressive Psychosis Developing after a Five-year Pre-pellagrous Period.
Scleroderma Associated with Symptoms of Erythromelalgia and Myxedema.
Clinic of Dr. G. Canby Robinson, Nashville, Tenn.
Coronary Occlusion, Associated with Ventricular Paroxysmal Tachycardia.
Clinic of Dr. V. P. Sydenstricker, Augusta, Ga.
Wilson's Disease (Progressive Lenticular Degeneration).
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Clinic of Dr. Groesbeck Walsh, Fairfield, Alabama.
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Dietetic Difficulties in the South.

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CONTENTS

(Continued)

MASSACHUSETTS MEDICAL SOCIETY
Section of Obstetrics and Gynecology 1002

BOOK REVIEWS
Medical Information in Sickness and Health. Philip Skrainka 1014
Treatment of Diabetes Mellitus. Elliott P. Joslin 1012

CORRESPONDENCE
The Appointment of Dr. Carl H. Ernlund. George H. Bigelow 1008
Articles Accepted by the American Medical Association Council on Pharmacy and Chemistry 1009
Thoughts Concerning Those Sufferers from Hernia Who Are, for One Reason or Another, Inoperable and Must, Therefore, Resort to Trusses. E. S. Garland 1008

MISCELLANY
Frequency of Disabling Sickness Among Industrial Employees 999
Instructive Cards on Preventive Medicine 1004
Massachusetts Tuberculosis League 1928-1929. The President's Address. Frederick T. Lord 1005
Medical Care and Treatment of Merchant Seamen and Other Government Beneficiaries by the Public Health Service 971
The Thomas William Salmon Memorial 1007
Trachoma Prevention Work of the Public Health Service 1006
A Trip to the American Medical Association Meeting 1003

NOTICE 1009

RECENT DEATH 1009

REPORTS AND NOTICES OF MEETINGS 1009

SOCIETY MEETINGS 1012

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held at the Copley-Plaza Hotel in Boston, June 10, 11 and 12, 1929

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The New England
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VOLUME 200 MAY 9, 1929 NUMBER 19

THE EMPTYING TIME OF THE KIDNEY PELVIS*

BY EDWARD L. PEIRSON, JR., M.D.†

FOR more than fifty years, since Englemann[1] first published his paper in 1869, it has been known that the emptying of the kidney pelvis is an active, not a passive, phenomenon. Since that time the physiology of the ureter and pelvis has been studied by a great many investigators. Wislocki and O'Conor,[2] and Graves and Davidoff[3] have reviewed this work very carefully. As the physiology of the ureter interests us only in its application to the diagnosis and treatment of surgical diseases of the kidney, it will be unnecessary to do more than state the facts which are known about the physiology of the ureter and kidney pelvis.

The pelvis and ureter form a muscular tube which has the power of contracting and, like the intestines, tends normally to contract in a rhythmic and purposeful manner. Starting at the kidney pelvis, peristaltic waves pass down the ureter to the bladder. In this way the urine is carried down to the bladder, producing a slight negative pressure in the kidney pelvis. These peristaltic waves have been repeatedly observed in animals, have been seen at the time of operation in man, and have even been measured in man by the connecting of a manometer to an inlying ureteral catheter.[4] The amount of negative pressure produced in a dog's kidney pelvis by this mechanism has been found by Lucas[5] to average 15 cm. of water, but may on occasions be as high as 72 cm. The contractions of the ureters are controlled by sympathetic and parasympathetic nerves, as well as by ganglions in the ureteral wall, and are, of course, affected by any of the drugs which act on these nerve systems.[6, 7] The two ureters are independent of each other, their activity depending on three factors: their nerve supply, the amount of distension of the lumen, and the character of the fluid they contain.[6, 7] Thus, although the secretory pressure on the kidney would tend to cause urine to run down into the bladder, the rhythmic action of the ureters also plays an important part in the emptying of the kidney pelvis. In support of this view, Trattner[4] found that, although he sometimes got a flow of urine from a ureteral catheter without evidence of peristaltic activity, the volume of flow was often directly dependent upon the waves of peristalsis. The intermittent flow of urine frequently seen from a ureteral catheter at cystoscopy confirms this observation. The cases where the flow of urine from the ureteral catheter seems independent of any peristaltic activity may be explained in most part by the fact that the ureteral catheter passes to the kidney pelvis, so that the peristalsis of the ureter, which is much more active than the pelvic peristalsis, has little chance to affect the flow of urine from the catheter.

The connection between the physiology of the ureter and surgical disease of the kidney is obvious. It is a well-known fact that hydronephrosis, pyonephrosis, kidney stones, and chronic pyelitis are often directly dependent on poor drainage of the kidney. Dilatation and the persistence of infection for the most part are caused by the backing up of urine in the kidney pelvis. With this principle in mind, the study of the emptying time of the kidney pelvis in a hundred routine cystoscopies was undertaken. By the emptying time of the kidney pelvis we mean the time it takes for the kidney to empty itself after the pelvis and ureter have been filled with sodium iodide. If we could find out whether or not the kidney pelvis emptied within the normal time, it would be possible to add valuable data to the information obtained by routine cystoscopy and pyelography. In this way we should be able to evaluate irregularities in the ureter which might be diagnosed as strictures or kinks.

The difficulty of accurate diagnosis of these conditions, as has frequently been pointed out in the past and more recently by Braasch,[8] is very great, as they may be stimulated in the ureterograms by physiological and anatomical variations in the outline of the ureter. Obviously, any kink or apparent stricture of the ureter, to be significant, must impede the drainage of the kidney. Thus, if we could determine whether or not the drainage of the kidney is normal, we should then have a very accurate standard by which to evaluate these findings. Likewise, knowing the emptying time of the kidney pelvis, we should be able to determine whether or not a given pyelogram shows dilatation. As there is great normal variation in the outline of the pelvis, this is often a very difficult thing to do, and one on which there is frequently a great deal of variation of opinion. In such a

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case, if the kidney pelvis did not empty within the normal time, we should be much more ready to pronounce it an early dilatation than if we knew that it drained perfectly. Thus, the emptying time of the kidney pelvis, if it could be proved to be reliable, should be a great help in the diagnosis and evaluation of early obstructive

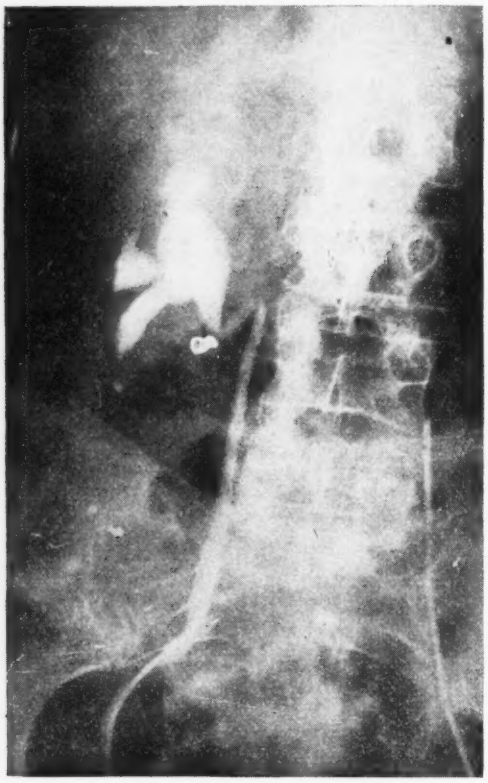


FIG. 1. A case of very low kidney with a marked kink in the ureter. The pelvis and ureter were completely empty at the end of nine minutes. This shows, we believe, that the kink in this case did not interfere with the kidney drainage.

lesions of the kidney pelvis and ureter, and should enable us, in some cases, to determine those which might reasonably be expected to become the seat of more serious trouble.

In the stomach, observation of the amount of barium that remains after six hours and of the peristaltic action is a routine part of the X-ray examination. Here the examination is easily made by fluoroscopy, but in the case of the kidney pelvis the image seen on the fluoroscope is indefinite, so that the study must be carried out by means of X-ray plates taken at various periods, after the kidney pelvis and ureter have been filled with an opaque mixture. Although this idea has been mentioned in several articles, the only systematic work we can find previously published on this subject is two articles by Goldstein.[9, 10] In these two papers Goldstein studied eighty-five normal and twenty-four pathological cases by his method of fractional ureteropyelography, which consisted of taking several X-ray pictures at various lengths of time after injecting the kidney pelvis and ureter with 13.5% sodium iodide solution. He found that the normal kidney pelvis was always empty in three to seven minutes after the withdrawal of the catheter. When this method was applied to pathological cases, he found that the emptying time was delayed from several minutes to several hours. From this he concluded that it was a method of great value in the diagnosis of urinary stasis of the upper urinary tract, and one which should be of great value in the early recognition of this condition. The results obtained by him in the normal cases are of great significance, but, unfortunately, in the pathological cases shown in the second article there was either an advanced degree of obstruction and dilatation or a very small amount of retention, so that the reader was left in some doubt as to the actual clinical value of the procedure.

FIG. 2. A case of very narrow ureter with some irregularity in outline. The pelvis and ureter were empty in nine minutes, probably showing that there was no significant stricture present.

Our work has been in many respects similar to that previously done by Goldstein, but our results have not always agreed with his, and we have tried to go further, in order to evaluate other factors which enter into the problem and to find out the actual clinical significance of the emptying time of the kidney pelvis. The routine procedure was to fill the kidney and ureter with a known amount of 12% sodium iodide through a ureteral catheter, take a plate just as the catheter was withdrawn, and then take one or more subsequent plates. After experimenting with various time intervals from three minutes to half an hour, we decided upon one plate taken

nine minutes after the catheter had been withdrawn. This is the time used in these cases and referred to in this paper as the normal emptying time. More information can be gained if plates are taken every few minutes; but this is not practical because, if the Bucky diaphragm is used, there is grave danger of burning the patient from over-exposure, and if the Bucky diaphragm is not used, the plates are usually unsatisfactory. Accordingly, we have frequently contented ourselves with one plate taken as near nine minutes after the withdrawal of the ureteral catheter as was possible.

FIG. 3A. A case with a small stone in the lower end of the ureter, giving no clinical evidence of retention or obstruction to catheterization, and with only slight blunting of calices.

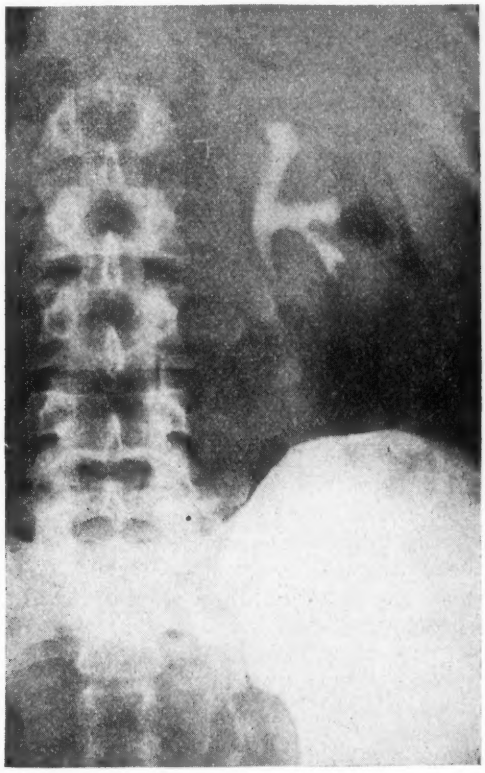


FIG. 3B. The same case (3A), nine minutes after withdrawal of the catheter, showing marked retention of the opaque solution. Although not well shown in the reproduction, the retention of opaque solution extends down the ureter to the stone.

In our series of one hundred cases there were thirty-eight cases which we feel certain, from clinical examination, cystoscopy, and pyelographic findings, had no disease or abnormality of the urinary tract. To this group we shall add another group of twelve cases which had no abnormal findings other than a few white blood cells in the urine. In most of these cases a diagnosis of mild pyelitis was made; but as they differ in no other respect from the thirty-eight normal cases, we have classed these two groups together, making a total of fifty normal cases. In thirty-five of these cases the kidney pelvis was completely empty in nine minutes; many of them had other plates taken three and six minutes after injection. In several it was found to be empty in six minutes, and in some it was even empty at the end of three minutes. Twelve cases, although the kidney was not completely empty at the end of nine minutes, were roughly classified by comparison of the two X-ray plates as more than three-quarters empty. In three cases it was not empty. Although Goldstein states that all normal kidneys are empty of the sodium iodide at the end of seven minutes, we have been unable to detect any abnormality in any of these cases. This variation from Goldstein's figures may be due to the fact that we determined the emptying time with the patient lying down, while he studied his cases in the sitting position.

Let us group the cases in which the kidney was three-quarters empty together with those where it was completely empty, as a class showing marked activity in the drainage of the kidney pelvis, and label them practically empty. Then we find that in forty-seven out of fifty normal cases, or 94%, the kidney pelvis was practically empty, whereas in only 70% was it completely empty. From this, as far as we are able to go with such a small number of cases, we are forced to conclude that there is normally great variation in the emptying time of the kidney pelvis, and that the normal kidney pelvis is practically (more than three-quarters) empty at the end of nine minutes. This does not give us such a beautiful sharp line as Goldstein was able

to draw. We cannot say that every normal kidney pelvis should be empty in nine minutes, but we can easily make a distinction between the cases which are empty, or nearly empty, at the end of this time, and those which have shown practically no tendency to empty. This variation in the normal is quite in accord with the known principle of medicine, that there often is no sharp line between the normal and the abnormal. In retrospect, it appears that our results might have been easier to classify if we had used a longer time interval, and we believe, in the future, that if only one plate is to be taken, it can be taken most advantageously ten or eleven minutes after injection.

In the cases where there was definite cause for obstruction of the ureter, the findings were very different. There were five cases of stone in the ureter in this series. In all these there was no obstruction to the passage of a ureteral catheter, and no clinical evidence of interference with drainage. One case showed marked dilatation of the pelvis and ureter, two cases slight dilatation of the pelvis, and in two cases there was no dilatation at all. At the end of nine minutes, all five cases showed almost complete retention of the sodium iodide, which filled the kidney pelvis and the ureter down to the stone. Thus, we were able in every one of the five cases, where we had reason to expect interference with the drainage from the kidney pelvis, to demonstrate that the emptying time was much increased. If there had been marked hydronephrosis and clinical evidence of obstruction, these findings would not have been significant, but as we were able to demonstrate delay in drainage where there was no clinical evidence of a blocked kidney, and in two cases where there was not even a slight hydronephrosis but yet where there must have been some obstruction, we are brought inevitably to the conclusion that this method of study will reveal even slight degrees of ureteral obstruction. Moreover, the fact that the opaque mixture was seen to extend down the ureter to the point of obstruction was of great value. It enabled us in one case to be sure that a shadow seen in the course of the ureter was actually a stone in the ureter, and in another case it enabled us to suspect the presence of a ureteral stone which did not show up in the X-ray and did not obstruct the catheter. In the cases of ureteral stone, the finding of failure of the kidney pelvis to empty in every case was in marked contrast to the normal cases, where 94% were practically empty, and allows us to put some faith in observations made upon the emptying time of the kidney pelvis.

A definite diagnosis of kidney disease was made in twenty-four cases. Of these, sixteen showed very little evidence of emptying at the end of nine minutes, and eight were empty, or practically so. Many of these cases showed a marked hydronephrosis; and wherever this was demonstrable, the emptying time was invariably delayed. In spite of the fact that Goldstein says the size of the kidney pelvis does not make any difference in the emptying time, we are inclined to believe that it takes a large kidney pelvis longer to empty than a smaller one. This is, of course, hard to prove, because, where there is dilatation of the pelvis, there is usually also some obstruction, which, in itself, would tend to cause retention. Our cases seemed to show that any pelvis which held over 15 c.c. was apt to show retention at the end of nine minutes, but below this figure it seemed to make little difference how much the pelvis held.

The increased size of the pelvis was not the only factor causing retention in many of these cases. In four cases of tuberculosis of the kidney there was no increase in the size of the pelvis, and yet it did not empty in the usual time. The delay in these cases was probably due to a tubercular involvement of the wall of the ureter, which either interfered with its peristalsis or constricted its lumen. One case which was studied in detail was that of a man who had had a bilateral ureterostomy done for cancer of the bladder. His ureters were dilated to the size of a No. 16 catheter, and the kidney pelvis held 30 c.c. There appeared to be free drainage from the kidney, and a large catheter could be passed easily to the kidney pelvis. Thirty c.c. of sodium iodide was put in and, in spite of the fact that it looked as if it could run out more easily than in a normal case, most of the sodium iodide was still present at the end of thirty minutes. This can best be accounted for by assuming that chronic dilatation of the ureter and pelvis produced an atonic paralysis so that they were no longer able to empty themselves rapidly. The same phenomenon was observed in a case of congenitally dilated ureters. In this case it appeared, on first glance, that as the whole ureter was much larger than normal, it should empty more readily; but in reality just the reverse of this occurred, due, we presume, to the lack of normal ureteral activity.

The significance of ureteral kinks has been debated for many years; recently Hunner[11, 12] has brought forth the question of ureteral strictures. Both of these conditions are hard to diagnose and form a fertile ground for disagreement. What one person would call a sharp ureteral kink demanding a nephropexy, another might call a kink of no significance; whereas, what one person would call a stricture, another person might call a physiological narrowing or temporary spasm. In order to throw some light on diagnosis in this confused field, we have selected for consideration the remaining twenty-one cases of our series of a hundred. Any case which showed, in addition to a possible stricture or ureteral kink, any other evidence of pathology, we have classed under one of the headings already discussed. These twenty-one cases

were all normal except for the appearance of their ureterograms. Eight of these cases showed ureteral kinks of a greater or lesser degree; in seven of these eight cases the renal pelvis was empty at the end of nine minutes, showing, we believe, that the kinks were not obstructing the flow of urine and that there would be no benefit from an operation to straighten the course of the ureter. In contrast to this, we have the case in which it did not empty, and also several other cases with ureteral kinks which are not included here as they showed definite hydronephrosis. These might, perhaps, be helped by operation as they did not appear to empty as rapidly as the normal kidney. In thirteen cases the ureterograms might be interpreted as showing ureteral strictures without other pathology. In five of these the kidney pelvis failed to empty, and in eight it drained satisfactorily. It is of some importance to note, in this connection, that retention of the opaque mixture in the ureter was rarely seen except where there was some abnormality of the ureter, and that in the cases of abnormality of the ureter with retention, the opaque solution was usually seen retained in the pelvis and ureter down to the site of the apparent obstruction. There was one interesting case of stricture of the ureter in this series, where the emptying time was determined before, and three weeks after, dilatation. In the first plate there was retention of the opaque solution down to the area of the stricture; and in the second plate, three weeks later, the stricture had disappeared and the kidney pelvis was empty in nine minutes. The retention of the opaque mixture above the area of narrowing does not prove that this area is a stricture; but it seems justifiable to assume, in view of the cases of stone in the ureter, that where the emptying time is normal, there can be little obstruction to the emptying of the kidney pelvis. If the stricture does not cause obstruction, it seems to us unlikely that it can cause symptoms.

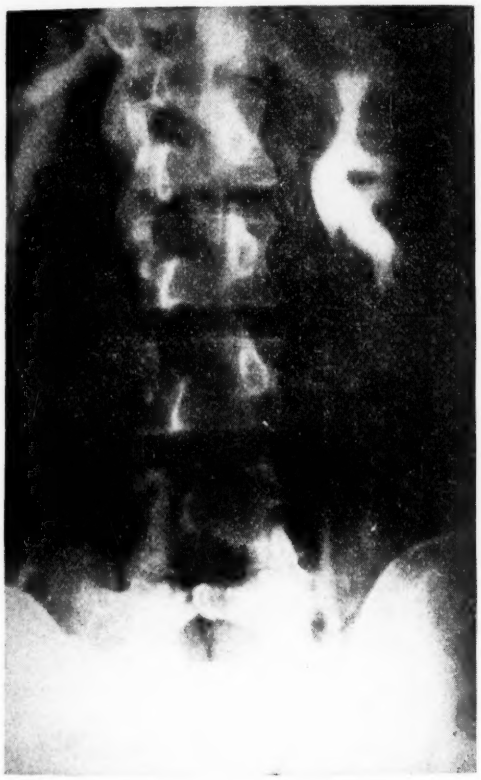


FIG. 4A. A case with a stricture of the upper end of the ureter.

FIG. 4B. The same case, (4A), nine minutes after withdrawal of the catheter, with almost complete retention of the opaque media above the stricture.

There are, however, various factors which may change the emptying time of a normal kidney. To determine the emptying time, a ureteral catheter must be passed up the ureter and a somewhat irritating solution injected. Either factor might be enough to modify the ureteral peristalsis, and anything which affected ureteral peristalsis would also affect the emptying time of the kidney pelvis. Various workers[12, 13, 14] have shown experimentally that pinching or irritating the ureter in any way will cause a contraction ring to form, from whence peristaltic waves go out in both directions. Penfield[14] suggests that this may occur during pyelography. On the other hand, Wislocki and O'Conor[2] found, in passing a catheter up the ureter of a dog and injecting sodium iodide, that the response was one of increased normal peristalsis. In any case, we must be on our guard against

drawing the wrong conclusions from conditions produced as a result of ureteral irritation. Although it would seem that the rate at which urine was being excreted by the kidney would greatly influence the speed of emptying of the kidney pelvis, this was not found to be the case; cases with a rapid flow of urine from the ureteral catheter were just as apt to have a delayed emptying time as those in which the flow from the catheter was very slow. Observations were made, to try to determine if the emptying time was increased or delayed when renal colic was caused by the injection of sodium iodide. It would seem that the presence of renal colic must indicate some disturbance of normal peristalsis, and should, therefore, affect the emptying time of the kidney pelvis. In this way we hoped to gain some information regarding the mechanism of colic. Although there seems to be some tendency toward an increased emptying time in the presence of renal colic, our observations upon this subject have been inconclusive. The speed of emptying of the kidney pelvis did not appear to be influenced by the age or sex of the patient, nor by an injection of morphine before the cystoscopy.

We feel very strongly that the evidence obtained in a study of the emptying time of the kidney pelvis must be considered in the light of the known facts and not be regarded as conclusive in itself. The greatest possibility of error lies in assuming that any kidney which has not emptied at the end of nine minutes is necesarily pathological, because, as has already been pointed out, retention may be caused by ureteral spasm as a result of ureteral irritation. We have seen one apparently normal case with complete retention on the first examination and a normal emptying time upon repetition of the test. There is also a theoretical possibility that a ureter in which there is definite obstruction may be stimulated to more active peristalsis by the sodium iodide's temporarily overcoming the obstruction, so that it will empty in the normal time in spite of the fact that there is actually obstruction present. We have not, however, found this factor to be of importance. In every case of hydronephrosis, except in four in which the pyelectesis was doubtful, and in every case of ureteral stone, we have found the emptying time greatly prolonged. Thus we feel that it is safe to assume that any kidney which is practically empty at the end of nine minutes has normal kidney drainage. If it does not empty in nine minutes, we may suspect that there is obstruction, if the kidney pelvis is not unduly large, but we cannot be sure that the delay has not been artificially produced.

SUMMARY AND CONCLUSIONS

The determination of the emptying time of the kidney pelvis is of value as a routine procedure in pyelography. The results obtained are of value in the diagnosis of cases of ureteral obstruction, whether it is caused by stone, kink, or stricture. In addition, the emptying time gives an indication of the amount of interference with kidney drainage, and helps in the determination of the most suitable type of treatment.

The emptying time was determined in a hundred cases by taking an X-ray picture nine minutes after the kidney pelvis and ureter had been filled with sodium iodide solution and the ureteral catheter withdrawn. There appears to be great variation in the emptying time of the normal kidney, so that it is not always possible to distinguish the normal from the abnormal; but from our studies it seems that the normal kidney should be more than three-quarters empty at the end of nine minutes. Generally, where there is definite obstruction to the overflow of urine, the second plate will show marked retention of the opaque media, which will be seen extending down the ureter to the point of obstruction. Where the kidney pelvis is nearly empty in nine minutes, it is safe to assume that little or no interference with drainage exists.

The general procedure outlined in this paper can easily be carried out as a matter of routine, without inconvenience to the doctor or the patient. If this were done, we believe many valuable data would be collected.

BIBLIOGRAPHY

1 Engelmann, T. W.: The Physiology of the Ureter. Archiv. f. d. ges. Physiol., 2: 243-293, 1869.
2 Wislocki, C. B., and O'Conor, V. D.: Experimental Observations upon the Ureter with Especial Reference to Peristalsis and Anti-Peristalsis. Johns Hopkins Hosp. Bull., 31: 197-202, 1920.
3 Graves, R. C., and Davidoff, L. M.: Studies of the Ureter and Bladder with Especial Reference to Regurgitation of Vesical Contents. J. Urol., 10: 185-231, 1923.
4 Trattner, H. R.: Method for Recording Contractions of the Intact Human Ureter. J. Urol., 11: 477-487, 1924.
5 Lucas, D. R.: Physiological and Pharmacological Studies of the Ureter, III. Am. J. Physiol., 22: 245, 1908.
6 Santi, Y.: Studies of the Ureter. Am. J. Physiol., 49: 474-495, 1919.
7 Santi, Y.: Experimental Studies of the Ureter. The Cause of Ureteral Contractions. Am. J. Physiol., 50: 342-351, 1919.
8 Braasch, W. F.: Stricture of the Ureter. J. A. M. A., 91: 1263-1268, Oct. 27, 1928.
9 Goldstein, A. E.: A Scientific Study of the Normal Human Ureter by Fractional Ureteropyelography. J. Urol., 6: 125-132, 1921.
10 Goldstein, A. E.: Urinary Stasis in Ureteral Obstruction. J. Urol., 14: 33-45, 1925.
11 Hunner, G. L.: End Results in a Hundred Cases of Stricture. J. Urol., 12: 295, 1924.
12 Hunner, G. L.: Drainage as a Factor in Renal Disease. Surg., Gyn. and Obs., 43: 615-626, 1926.
13 Rothmann, H.: Physiology of Contractions of the Ureter. Klin. Wchnschr., 6: 603, 1927.
14 Penfield, W. G.: Contraction Waves in the Normal and Hydronephrotic Ureter. An Experimental Study. Am. J. M. Sc., 160: 36, 1920.
15 Schmidt, A.: Peristalsis of the Human Renal Pelvis. Beitr. z. klin. chir., 138: 325-338, 1927.

NEW ENGLAND SURGICAL SOCIETY

THE OPERATIVE TREATMENT OF VARICOSE VEINS, VARICOSE ULCERS AND PHLEBITIS*

BY JOHN HOMANS, M.D., F.A.C.S.†

THE operative treatment of varicose veins has long had a bad name both with the laity and the profession. I cannot speak for the laity but I believe that the profession has taken the lazy man's attitude toward varix of the legs, and surgeons have put far more energy into searching for mechanical short cuts than into performing intelligently conceived and painstaking surgery.

Varix occurs in the superficial, not the deep, veins and for very good reasons. The deep veins, large in number and capacity, lie inside the muscular aponeurosis supported by tonic and voluntary muscular contraction. The superficial veins, that is, the great and lesser saphenous systems, lie between the deep fascia and the skin. The deep veins receive a vast quantity of blood which, since their valves are so set as to permit the passage of blood only toward the heart, is squeezed through them by muscular pressure even against gravity. There is a feeble push from the capillary bed and perhaps a little pull from above, but muscular squeezing is the main factor. If you don't believe this, try standing still with your muscles relaxed for ten minutes and see how you like it. You will soon wish to shift your feet and tighten your muscles to put the muscular mechanism into action.

The superficial veins, on the other hand, transmit relatively little blood, and though they are abundantly furnished with valves, are not very well fitted to forward it against gravity. They lie in fat between the skin and the deep fascia and such muscular pressure as is made upon them is far less effective than that which works upon the deep veins. It results that they readily become distended, their valvular mechanism breaks down, they develop tortuosity and sacculation and present the picture known as varix or varicose veins. I need not carry you into the pathology of this state for I am trying here only to make the point that the deep venous circulation is well protected and dependable, the superficial circulation poorly protected and readily disturbed. Doubtless the latter would break down oftener were there not a quite effective overflow system, in the form of perforating, or communicating, veins (in the calf), connecting the superficial with the deep venous circulation.

The course of the blood-flow in varicose veins has never adequately been worked out. Nevertheless as I visualize the matter, when the individual stands the veins fill from above with blood which, however, is more or less rapidly drawn off by the communicating vessels into the deep system; for blood must always pour from the superficial varicose veins into the normal, efficient, deep veins as soon as the pressure in the former rises higher than that in the latter, a state which is inevitable whenever the subject stands or even perhaps sits. The course of the flow from the superficial to the deep vessels is favored by the arrangement of valves in the communicating veins but as Trendelenburg long ago pointed out, the valves are not essential to the overflow mechanism.

As a result of the considerations just described, it is evident that the inevitable result of varix is stagnation and back-pressure—indeed, it has been shown that as a result of a cough, the pressure in a varicose vein may rise as high as 250 millimeters of mercury, or far higher than normal arterial pressure—but thanks to the capacity and effectiveness of the deep veins, the disturbances caused by varix are usually very little noticeable. A feeling of heaviness or of tingling upon long hours of standing, to which many persons are utterly indifferent, may constitute the sole symptom. Only in occasional cases, local anatomic peculiarities may lead to the ill-nourishment of particular areas of skin and so, with the aid of trauma and infection, to ulcer. Occasionally, thrombosis occurs and, rarely, perforation.

If you accept this account as accurate, you will agree that varicose veins do nothing useful themselves, add to the strain upon the very tolerant but not inexhaustible deep veins and render their owner liable to ulceration and other complications; you will further agree that to be effective, treatment of varicose veins should keep them empty of blood or remove them altogether; and since they are of no earthly use to their owner and are actually causing the veins enclosed within the deep fascia to do extra work, you will inevitably conclude that to abolish varicose veins can never harm the person having them but must always be of benefit to him. Of course, if you bandage a varicose leg just tight enough to keep the distended veins empty of blood, you relieve the patient's symptoms. Therefore bandaging, well-done, is a satisfactory treatment and has an important place, but I am not dealing here with palliative measures.

There is only one more matter to discuss before considering technical surgical procedures and that is the method of identifying varix. There isn't much doubt of the diagnosis when great

*Read before the meeting of the New England Surgical Society, New Haven, Conn., November 9, 1928.

†For record and address of author see "This Week's Issue," page 1001.

tortuous veins stand out upon the patient's skin but sometimes very few veins show and in other instances, a good many veins are to be seen which are partly or not at all varicose. Trendelenburg settled that matter many years ago. He showed that blood flows down a varicose vein. To carry out his test it is only necessary to empty the superficial veins by raising the affected leg above the level of the body—then to lower it suddenly, when the blood can be seen and felt (by the examiner's fingers) to fill the varicose veins with a rush. The test can be made almost more dramatic by repeating the manoeuver with the variation that a tight constriction is made upon the thigh while the leg

FIGURE 1. The use of the constricting band to demonstrate the Trendelenburg test. In the figure on the right the veins have been emptied of blood by elevation, the constricting bandage has been applied just tightly enough to compress the superficial veins and the leg has been lowered. The varicose veins below the band remain empty.

In the figure on the left the band has been loosened and the down flow of blood fills the varicose veins.

is still elevated, preventing the down flow of blood when the leg is lowered (Figure 1). In that case, the empty, collapsed veins below the constriction only gradually fill from the capillary side (unless the perforators permit an outflow from the deep veins, which is unusual) and if the constriction is suddenly released before such filling can occur, the varicose vessels fill with a palpable shock.

My reason for insisting upon a positive diagnosis of varix is that operations performed for incomplete varicosity are most unsatisfactory. Oedema usually follows and lasts for many months. This is due to a peculiar relation between the veins and lymphatics which I can hardly take up here.

The Operation for Varicose Veins may be performed upon patients of any age provided they are in reasonably good health. It should never be performed, however, as anything but a major procedure for it requires as perfect aseptic technic as any operation in surgery and to be finished in a painstaking manner usually requires more than an hour (for one leg). There seem to be extraordinary misconceptions about the procedure. To be of any permanent advantage to the patient, that is, to completely and finally relieve back pressure in the superficial veins, the great saphenous vein must be excised, root and branch, from its entrance into the femoral at the groin, downward, and if any part of the operation is indispensable it is the removal of the saphenous vein in the thigh. Yet I venture to say that many surgeons are content to remove only the varicose vessels of the calf, a perfectly useless procedure since the varicose vessels of the thigh, which are still left connected with the valveless abdominal veins, will soon distend a new set of veins in the lower leg and within six months to a year the only evident change which surgery has brought about will be the presence of a scar. I hope I have already dealt with the other and quite understandable misconception that removal of varicose veins takes away something the patient needs and throws a burden upon the deep circulation. The contrary is, of course, true. Parenthetically, I might add that if the deep veins were not at all times efficient, the varicose leg could never be left dependent without turning deep blue or black for it would be utterly congested.

To return to the complete operation for varix, the leg should be prepared by shaving from the pubis to the toes, and the skin made clean by any standard method. The initial incision three to four inches long is made in the groin just below and parallel to the inguinal ligament. In this way the great saphenous vein is readily picked up, followed to its entrance into the femoral and divided perhaps a half inch from its origin. A liberal stump should be left distal to the tie for I have seen a patient push off the ligature in vomiting. But the success of the operation really depends on the thoroughness with which all branches which might in the future act as connecting links between the great abdominal veins and the odd remains of veins in the thigh and calf, are sought out and excised. My own recurrences arise as a rule from failure to carry out this part of the operation to perfection.

How the great saphenous channel shall be removed from groin to knee is a matter for the operator's choice. He may select an open dissection—a most tedious procedure—but as a rule he will strip the vein with the acorn or ring stripper down to a point just below the knee. From this point on it is usually well to make a clean cut downward upon the inner side of the

calf toward the ankle. This is the least essential part of the operation so far as the relief of symptoms is concerned but it is essential to a good cosmetic result, an important matter in these days when the women folk wear skirts down to the knees only. But before beginning this dissection, close the wounds in the thigh and take fresh dissecting instruments. The tissues of the varicose leg are quite easily infected and, after all, it is just as improper to use the same instruments for a series of incisions upon one patient as to carry them from one patient to another.

It is a good rule, also, to carry the initial incision down to the deep fascia no matter how many times a tortuous vein is cut. Bleeding can be controlled by pressure and by hemostats. Then narrow strips can be turned up and the veins removed from the deep side of the flaps. By this method the nutrition of the skin is very little disturbed and danger of sloughing along the edges of the wound is made remote. It is hardly safe, however, to turn back flaps wider than one to one and a quarter inches for the arterial supply comes entirely from fine perforating vessels which have a narrow field of distribution. In such an operation, the Halstedian principle of taking up in fine hemostats the least possible bit of severed vessel and of doing the slightest possible injury to the soft parts is vital to clean healing. I make a point of these technical matters because I hear it said that wounds in varicose legs heal badly, and that pulmonary infarction, and even embolism, is common. Such accidents are in great measure due to poor technic and have driven surgeons and others to the palliative, incomplete procedures of which I shall have more to say presently.

There are one or two tricks of operating that are worth remembering. When there is present in the calf a great mass of veins closely adherent to the skin, it is well, if possible, to excise covering skin and veins together, provided the resulting wound can be closed without undue tension. When pigmented and slightly indurated areas are encountered, it is better not to make incisions through them. Never make a longitudinal cut along the inner side of the knee, for a keloid scar is likely to result. And don't depend solely upon cutaneous stitches to close incisions. Subcutaneous continuous stitches closing dead space and anchoring the line of incision to the deep fascia are very useful.

The Treatment of Varicose Ulcer.—Any one who takes pains can cure varicose veins by radical operating and expect as good results as are given by any other sort of surgery—satisfactory late results in perhaps 90 per cent. of all cases—but the cure of ulcer is more difficult. The simplest type of ulcer is the one which rides upon a varicose vein or is so clearly tributary to a mass of varices that removal of the veins proximal to it will obviously relieve local stasis and back pressure. When you are dealing with such as this, particularly if the ulcer is neither very aged nor calloused, remove the veins down to the region of the ulcer, ignoring the sore itself.

When, however, an ulcer is so large or so calloused, or both so large and calloused, that even if once covered with epithelium it could hardly be expected to remain healed, excision is advisable. Palliation, as by incisions through its base, by nerve stretching or periarterial sympathectomy does not go the root of the matter. Excision should be radical and include the deep fascia, that is, the muscular aponeurosis beneath the ulcer. In carrying out this procedure, the veins should first be excised down to the proximal part of the ulcer zone and the incision sutured and covered. Then, and not till then, the ulcer, with a good margin of sound skin, is dissected up in one piece. Excision, with the ulcer, of the deep fascia insures a sound vascular base for the subsequent skin-graft and almost guarantees a clean surface free from infection. The skin-graft may be performed at once or delayed. I prefer, myself, a Thiersch graft applied immediately. (Figures 2 and 3.)

There is of course room for the exercise of surgical judgment in matters of this kind—whether or not to excise an ulcer and whether to operate in one, two or more sittings. But it is particularly necessary to have the patients' confidence. Be sure they understand that they may have to give a good deal of time to the matter, and that any one step may perhaps be one of trial and error. There is no ulcer so bad that it cannot be benefitted by radical surgery. Nor need there be anxiety about the extent of the scar tissue which is removed. Several times I have excised an ulcer which made a complete ring about the leg. I am not sure, however, that if one of these wide excisions were followed by sepsis, the results might not be disastrous. But as I have yet to see infection follow one of them I cannot speak with authority upon this point.

One more matter about ulcer. I should not wish to be understood as saying that there are no useful methods of palliation. Suppose that just proximal to a well defined ulcer there lies a "lake" of blood, that is, a greatly distended vein or mass of varices. And suppose that the patient is unable or unwilling to submit to operation. You may block the back pressure of blood which is maintaining the ulcer by a little pad of absorbent cotton strapped on over the varicose vessel with adhesive plaster and pressed in (not too hard) with a bandage. This is almost equivalent at times to rest in bed and the ulcer can be made to heal rapidly under adhesive strapping. Or you may use a similar scheme and cover everything with a "jelly" (Unna's paste) bandage. You may even for a momentary advantage divide veins locally in the calf under novocaine. But if you con-

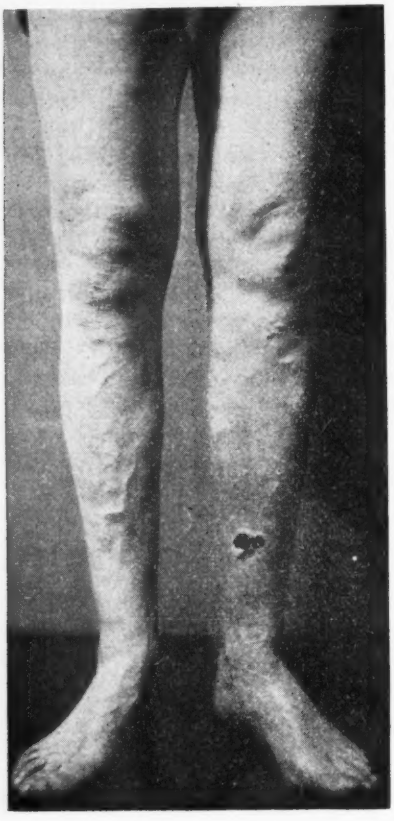


FIGURE 2. W. H. A varicose ulcer having a broad and very indurated base. The varicose veins are very little noticeable. See Figure 3, the result of operation.

FIGURE 3. W. H. Two years later. The result of removal of varicose veins and excision of the ulcer. The Thiersch graft can only be distinguished by its relatively light color.

template such a temporary expedient you may just as well, perhaps, try the method of injection about which so much is being said nowadays.

The injection method consists in the insertion of a needle into a varicose vein and the injection therein of a sclerosing solution. The present methods were evolved some ten years ago in Europe principally by Sicard and his followers, though the ideal solution is perhaps still to seek. Several injections can be made at a sitting so that without being laid up in bed a patient may in the course of a week or two have had obliterated a good many varicose veins or segments of vein in the calf. I cannot go here into indications and contraindications. It is enough to say that varicose veins are often not sufficiently "get-at-able" to be reached with the needle and that if a drop of the strong solutions used gets into the skin or subcutaneous tissues, a slough occurs. There is, however, very little risk of embolism if the routine directions are followed.

I have said that obliteration of veins by injection is suitable to the temporary cure of an ulcer. That, in spite of what you may hear to the contrary, is about all the operation can properly be asked to do. For at its best it is equivalent to a local excision of veins in the calf and that is never better than a temporary expedient. I venture to predict that injection, after a short period of popularity during which a good many sloughs and thromboses may be caused, will subside into its niche as a procedure of very limited usefulness. I should add that it may be available as a purely cosmetic measure provided its temporary character be admitted.

Thrombo-Phlebitis complicating Varix.—One of the most troublesome complications of varicose veins is thrombosis, which in some instances, remains confined to a group of dilated vessels in the calf. Usually it extends into the thigh, but though often it travels up to the groin and only ends at the saphenous opening, I have never seen thrombosis communicated from the great saphenous to the femoral, and though I have known small emboli to be repeatedly detached, I have yet to see a fatal embolism.

There is great variability from case to case in the intensity of the inflammatory process associated with thrombosis. In some instances a clot is formed with so little periphlebitis that the skin over the thrombosed vein is not even adherent to it. In others the skin is red, the soft parts indurated and rarely the clot breaks down and actually suppurates. As a rule there is slight local heat, moderate redness and little induration. It is noteworthy that the leg never becomes oedematous as in the phlebitis of veins previously normal.

One of the most annoying things about the thrombosis of varix, outside of its slow progress toward recovery, is the fact that it never causes

obliteration of the veins but ends in resolution or tunnelling and leaves the varicose vein quite as useless as before. Worse than that, it leaves the vein liable to a recurrence of the thrombosis, so that a patient who has been laid up for six weeks with the disease may no sooner have got about again than the trouble recurs.

For such reasons I believe in treating thrombosed varicose veins very radically. If the inflammatory reaction is mild from the start or if after a week in bed it has notably subsided, I believe in excision of the varicose thrombosed vessels. There are, however, certain precautions to observe. The dissection should be begun at the groin as for the ordinary operation for varix, but if the vein is thrombosed up to its entrance into the femoral, it should be ligated and divided very gently lest a clot be detached. Stripping cannot be performed and it is usually necessary to make a very open dissection, removing adherent skin with the thrombosed veins themselves. Should the vein be adherent to the skin upon the inner side of the knee I usually make a series of short transverse cuts at that point and poke out the segments of vein between incisions as best I can, leaving small rubber tissue drains. In general, however, the wounds heal very well and require no drainage whatever. Instead of being laid up for many weeks while the thrombosis is slowly spreading and regressing, the patient is through with the whole matter in three weeks and is no longer troubled with thrombosis or varix either. Several times I have performed excisions under local anaesthesia when the thrombosis occurred after other operations and on one occasion I removed, during pregnancy, a thrombosed vein from which small emboli were being constantly detached.

I wish I had time to go farther into the vagaries of varicose veins and ulcers and the variations upon the sort of treatment I have outlined. Many of you are doubtless quite familiar with this field, but I am sure that there are many who, from lack of familiarity with it or as a result of accidents and complications reported and seen, believe it to be forbidden ground. In one locality I discovered that the surgeons felt that they could not operate without seeing pulmonary infarcts during the convalescence. With this attitude I am impatient. I admit that post-operative embolism occurs, particularly in the elderly, but no more often than in pelvic operations. I doubt if its incidence should be over one per cent. Altogether you will realize that I am an enthusiast in regard to the radical surgery of varicose veins and ulcer, and I hope that when you have discounted this enthusiasm you will still find in these remarks some germs of truth.

Discussion

Dr. A. M. Rowley: *Mr. President and Members*—We are always interested in what Dr. Homans has to say about the circulation of the extremities, and I am interested today, and I was particularly interested in his paper of last May.

In considering this disease we must keep in mind the changing pathology. Early, it is comparatively simple, being a varicosity generally limited to the greater saphenous system. Later, this is a small part of the picture, there is varicosity not only of the long saphenous vein but often the lesser, with sacculations, fibroses and thromboses, the valves in the perforating veins become incompetent, the lymphatic spaces are widened, there is stasis, the nutrition of the leg is impaired as evidenced by oedema, eczema, blueness and later by ulceration. There is a venous lymphatic trophic symptom complex. To cure this condition it is necessary not only to hold back the column of blood from above but to dam it from within, the ulcers generally ride upon a perforating vein, the lymphatic circulation should be improved by a modified Condoleon operation, the patient must have preoperative rest and intelligent post-operative treatment by rest, exercise, support and by correction of faulty posture and stance.

Dr. Homans's surgical results have I think been happier than mine for I have had in two cases post-operative infectious thromboses. It is a well-known fact that one attack predisposes to others and I have watched these cases over a period of years—why this should be I am at a loss to know. We have avoided trauma, have tried to exclude focal infections. It is possible that the bacteria lie dormant in the lymph spaces. Both of these cases healed per primum, without any demonstrable secretion in the wound and without redness. In the ligation of any vein a thrombus must occur but if it becomes infected unpleasant sequelae will follow.

Two days ago a man, on whom I had operated in 1922, came into my office. Following his operation symptoms developed which were diagnosed by several physicians in my town and in New York in one very good hospital, as erythema nodosum. The physicians told him it had nothing to do with his operation, but the eruption always occurred on the leg that was operated. We tried to recover material for vaccine, autogenous vaccine, from the eruption, and he thought he was benefited for a time. He came in yesterday and he had a mild phlebitis, and this has been a recurrent condition that has come over his leg for six years since 1922, and he has had at least fifteen attacks since that time.

Nor are these all of the cases of a similar nature, one I have treated for several attacks, was operated at Rochester for varicosity of the abdominal veins—I believe it is difficult with the best of technique, to do the radical operation such as I have done in the past, that is ligating the saphenous and its branches at the foramen ovalis and stripping the vein via a tunnel to the knee and by multiple incisions

removing it with many of its branches to the ankle, not to infect the tissue. Much trauma results and the time required is generally over an hour. Because of this, and believing, that in the early lesions it is only necessary to prevent the column of blood from settling back into the veins I have changed my technique and think it to be in these selected cases as efficient and attended with much less danger. I now ligate and section the vein and its branches at Scarpa's triangle below the knee through multiple small incisions, section the veins in several places but do not attempt any removal. This treatment has been very satisfactory and I think is curative when the perforating system is competent.

I wish to thank Dr. Homans for the opinion he expressed regarding the chemical obliteration of the veins and I thoroughly agree with him. If I am able to emphasize any point in the discussion it would be that of advising our patients to be early operated as a prophylaxis against the distressing late manifestations.

Dr. Lyman Allen: Mr. President, I hoped that this discussion would bring out something regarding the injection of these veins. I had expected that perhaps Dr. Homans would talk on that subject.

This fall at the meeting of the Vermont State Medical Society a very interesting paper was given on that subject by Dr. A. T. Bazin of Montreal, Canada, and a series of several hundred cases reported. The next day I happened to go to a meeting of the N. Y. & N. E. Railroad surgeons in New York and heard a paper on the same subject, and there many cases were shown in which varicose veins had been treated by the injection of one solution or another. The injections do not cause thrombosis but a thickening of the vein wall. The advantages of course come from the fact that the operation is done in the Out-Patient Department or office; the patient is kept quiet for 5 or 10 minutes, goes home, and then comes back and gets another injection in 8 or 10 days. A patient has from 1 to 3 or more injections. In only one case reported was there embolism and in one or two cases sloughing as the result of the fluid not being injected properly into the veins. If even half of what Dr. Bazin said is true, it is an operation that should be of interest, particularly because it has evidently cured patients without their being obliged to lose more than a part of a day at a time from their work. If anyone here has had personal experience with the injection treatment, I should like to hear him discuss it further.

Dr. F. B. Lund: I would like to endorse what Dr. Homans said about operating on these cases when they are thrombotic. It is the easiest time to operate on them; you don't get any bleeding, and it shortens their convalescence very much.

Concerning the injection treatment, some of the men at the Boston City Hospital have gotten very satisfactory results with it. Two or three cases of old men, with shortness of breath and varicose veins, have been treated by Dr. Charles Lund, with no trouble at all to the patient. An operation in an old and feeble patient is quite a serious thing. Two of these patients had been bar-tenders, so that since the Volstead act they have not had to stand up as much as they did. Still they had varicose veins, which had lasted over perhaps from the happy days of old.

Dr. J. M. Birnie: Dr. Dutton, of Springfield Hospital, has been very much interested in this subject and although he hasn't a very large series, he has a series of about 30 cases now, with no untoward results. He is very enthusiastic about the injection treatment.

Dr. S. A. Mahoney: Relative to the operative treatment of varicose veins, there is no doubt about the fact that there is a certain percentage of mortality. I know, personally, of three deaths taking place from thrombosis or embolism after the operative treatment. The cases after getting out of bed developed a pulmonary or cardiac embolism and death resulted very shortly.

I have become very much interested in the injection treatment and am now using it. It is very pleasing and many cases will consent to the injection that will refuse the operative treatment; in fact, now in our locality they are beginning to demand the injection treatment and refusing the operative treatment.

Dr. R. C. Cochrane: Dr. O'Neil, at the City Hospital in Boston, recently reported 189 cases that had been done by the injection method, with no bad results except when they first began to do them they used strong solutions of sodium chloride and also sodium salicylate, which did occasionally produce sloughs due to the solution leaking out of the vein. I think at the present time he is not using either of those solutions but a solution of quinine and urethane, and he thinks that that is much more satisfactory. I know he is very enthusiastic about it and at the present time not many are being operated on at the hospital but most of them are being injected.

Dr. John Homans: I have been very much interested in the course of this discussion. There are one or two observations of Dr. Rowley as to recurrent phlebitis that I should like to allude to. I know of certain persons who have repeatedly suffered from attacks of scattered localized phlebitis, and I haven't dared to touch them, but the ordinary instance of phlebitis in varicose veins can be operated upon, I think.

The most important recent contribution to the treatment of varicose veins is that by injection whereby considerable stretches of vein are obliterated by a solution. This procedure is equivalent to the local removal of varicose veins

in the calf, and is open to the objection that since the varicosities in the thigh remain, the varicose veins in the calf will recur. Many of those who use the sclerosing injection method will say that they have recurrences, but that in such cases the injection is easily repeated. Remember that the injection treatment can hardly be applied to any but the part below the knees and that it obliterates the veins only below the knees, leaving the possibility of recurrence of varicose veins because the main varicose channel above is left.

At the Brigham Hospital we have tried to study the indications for this treatment, and I agree that it does not cause embolism and that it usually obliterates the veins. There are a few more complications, I think, than the remarks you have heard would lead you to suspect. I have seen one instance of a bad slough, but that was through the rather unskilled use of a strong saline solution. I have also seen a small slough from the use of quinine. I have seen a thrombo-phlebitis in a vein connecting with the injected vessel which laid the patient up as badly as an operation would have done. So that with all due respect to those who have contributed to this discussion, I do not believe there is any operation yet devised in this world which does not have a certain percentage of complications, and certainly this treatment is no exception. However, it does not involve any more risk than the average operation.

The presence of ulcer in people who cannot be operated on, or who don't want to be operated on, is quite a problem, and yet there is nothing that will cure an ulcer any quicker than the injection of one of these solutions. Moreover the cure of ulcer by injection, while not as a rule permanent, is likely to last for many months or even many years. Therefore, I have directed the staff of the Out-Door Department of the Brigham Hospital to use this method whenever they have to treat ulcers in people who must continue to work, and I am sure it will cure their ulcers for a considerable period. The other indication is entirely an esthetic one. In these days of short skirts, when ladies want to get rid of the appearance of these large veins in their calves, there is nothing nicer than the injection treatment. Those varicose veins are causing no symptoms but are merely a matter of looks.

When I advocate the operative treatment of varicose veins, I wish it to be understood that I am trying to get the most permanent possible cure for a condition which is causing the patient a good deal of trouble, and when one uses a palliative treatment, such as injection, one should confine it to a very limited field. I am willing to predict that it will be discovered of sclerosing injections that recurrences are very common and people will find that there is a certain amount of pain and discomfort and become weary of having needles stuck into them again and again. In fact, I don't think it will have quite as broad a field of usefulness as one might suppose, judging from the remarkably good immediate effects which have been reported. (Applause.)

MEDICAL CARE AND TREATMENT OF MERCHANT SEAMEN AND OTHER GOVERNMENT BENEFICIARIES BY THE PUBLIC HEALTH SERVICE

An interesting report by Surgeon General H. S. Cumming states that in accordance with a century-old practice hospital an out-patient treatment was furnished to American merchant seamen and other legal beneficiaries by the U. S. Public Service in the principal ports, about 150 in number, of the United States, Alaska, and the insular possessions. During the past year a total of 349,199 persons applied for medical services, including 105,159 who received physical examinations for Civil Service appointment or other reasons not related to treatment. There were 938 deaths in hospitals. The amount of service, and to a certain extent its degree, is limited by the funds available, which are by no means sufficient to meet all the legitimate demands upon it. It has been necessary to attempt to appraise the merits of various needs and to limit or even deny treatment for certain kinds of disabilities in an effort to do the greatest amount of good to the greatest number with the means at hand. Dental treatment, for instance, has been limited to about 50 per cent. of the demands.

In general, however, the marine hospitals furnish a creditable standard of care and all meet the standards prescribed by the American College of Surgeons. A large amount of relief was supplied—a total of 1,354,545 patient days in hospital and 638,794 out-patient treatments. The number of lepers segregated at the National Leper Home was the largest in the history of the institution, and the results of treatment are increasingly encouraging. At the end of the year 293 leper patients were under treatment at the Home, Carville, La.

The Coast Guard requires more medical and dental officers for the enlarged corps; the Employees' Compensation Commission and the Civil Service Commission have requested additional medical services; and recent acts of Congress have added new classes of beneficiaries and imposed additional obligations. The Merchant Marine Act approved May 22, 1928, is calculated greatly to increase the number and size of American merchant vessels and presumably will increase the personnel. Many requests are received from American ship owners for relief stations in ports not now supplied. The proposed new marine hospitals in Cleveland, Detroit, New Orleans, San Francisco, Galveston, and Philadelphia, and improved facilities that have been recommended in other ports, will aid the Service in meeting its increased obligations.

THE INJECTION TREATMENT OF VARICOSE VEINS*

BY E. EVERETT O'NEIL, M.D., F.A.C.S.†

THE widespread enthusiasm which has greeted the injection method of treating varicose veins, both in Europe and in this country, within the past few years, has led to considerable confusion and misunderstanding concerning this much-mooted procedure. The simplicity of the treatment, with its promise of relief, and the willingness of patients to escape operation, have provided for physicians a therapeutic agent which, if used intelligently, is a great boon in a very distressing condition, but if abused is a weapon of considerable harm. It is on account of the ignorance and confusion existing at the present time in regard to its employment that I propose to place before you certain conclusions concerning this method. These conclusions are based upon a series of 410 cases of varicose veins, entailing 2480 injections, treated in the Varicose Vein Clinic of the Boston City Hospital and in private practice, within the past year and half.

CASE 1. Before.

HISTORICAL

The injection method had its inception on any large scale in the Tubingen Clinic of Linser in Germany and in the clinics of Sicard and Genevrier in Paris. To be sure, sporadic attempts at obliterating varicose veins had been made by other investigators such as Tavel, who, in 1904, used a 5% solution of phenol to produce sclerosis; also by Desgranges, Durante, Tonal and others.

But to Linser, in 1911, working with mercuric chloride, later with sodium carbonate, and finally in 1923 with sodium chloride, to Sicard using sodium salicylate since 1919, and to Genevrier, using quinine hydrochloride and urethane since 1920, should go the credit for popularizing this work. These investigators and their co-workers, together with numerous others in England and Continental Europe have treated thousands of cases with such uniformly good results that the injection method in their hands has come to supplant all other operative or non-operative procedures. Within the past several years, the work has been carried on in this country with the same satisfactory results.

ADVANTAGES OF THE INJECTION METHOD

We may dismiss any non-surgical method as being palliative and reserved for the small group of cases which operation or injection cannot

*Read before the Norfolk District Medical Society, January 29, 1929.

†For record and address of author see "This Week's Issue," page 1001.

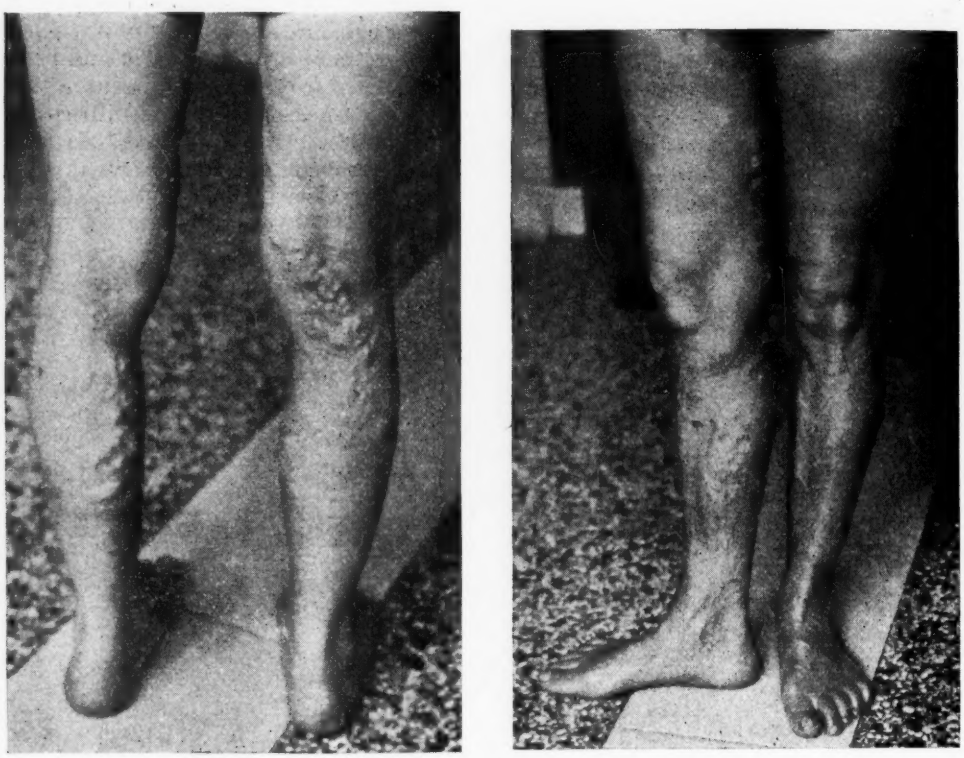
touch, i. e. the varicosities complicating pregnancy, extreme age, infectious thrombosis of the deep venous system, or existing bacterial phlebitis. Operations for varicose veins do not enjoy a very good reputation. At best the operation is a formidable undertaking, with its necessary hospitalization, expense and loss of time; with the possibility of post operative complications, particularly embolism, sepsis, and respiratory affections; and the later complication of unsightly scars on the lower legs—an important consideration with women at the present time. There is the further possibility of recurrence. In my series there have been 44 cases previously operated. Of these 39 have been operated once, 4 twice, and 1 three times. In deference to the operation, it is my conviction that its bad name is, in most circumstances, due to lack of a thorough job having been done. To be a success, the operation must be a radical one. The main saphenous trunk, together with its branches, should be removed, beginning high up, close to the femoral vein and extending to the inner aspect of the knee. And this should be done though there be no varicosity of the vein visible. The remaining dilated veins in the leg need then only be removed for cosmetic effect. The usual procedure, it seems, when the main trunk is not outstanding, is to remove only the dilated varices in the leg. This is almost sure to be followed by recurrence. Of the 44 recurrences above mentioned, only 7 had the radical operation performed.

The outstanding advantage of the injection method is that it is ambulatory. Patients can be treated in the hospital out-patient department or in one's private office and be immediately returned to their occupation. Housewives, factory workers, policemen, railroad attendants, —in short all types disposed to varix formation—have been treated in this manner with no untoward results. It is hardly necessary to suggest the great economic importance, therefore, which this procedure holds, particularly since it reaches a large group in the industrial class who, on account of the expense alone involved, would not submit to operation. Again, the injection method is applicable to those cases in which operative measures are interdicted; for example, where there is present a constitutional disease which contra-indicates general anaesthesia; or a local impoverished skin condition, perhaps complicated by eczema and ulcers, which necessary wide dissection would only further mutilate; or again, a recurrence of veins previously operated.

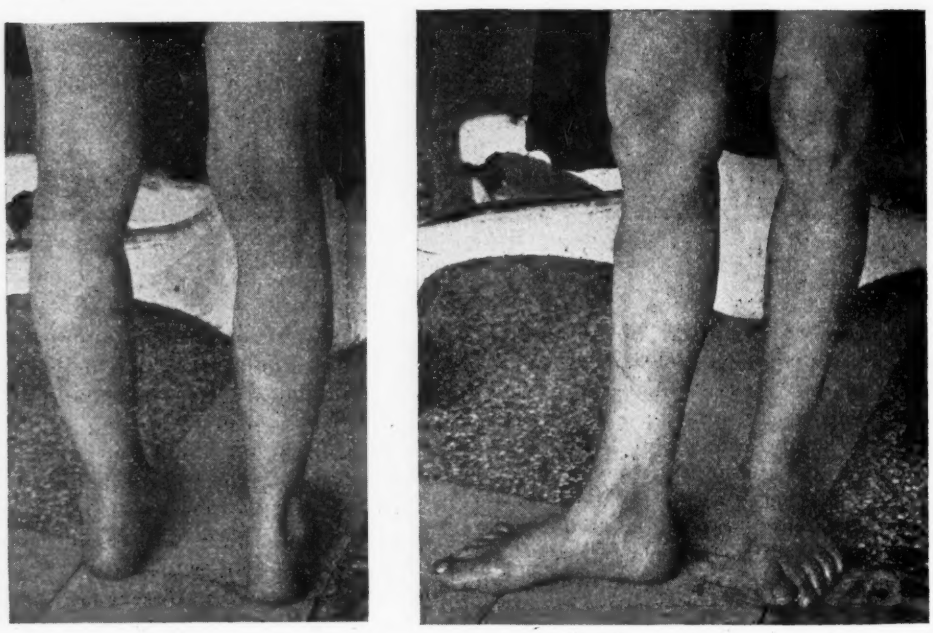
In regard to the cure of varicosities, I feel toward any chemical obliteration of veins the same as I do toward operative measures. It

CASE 1. After—3 injections—30 c.c. 20% sodium chloride.

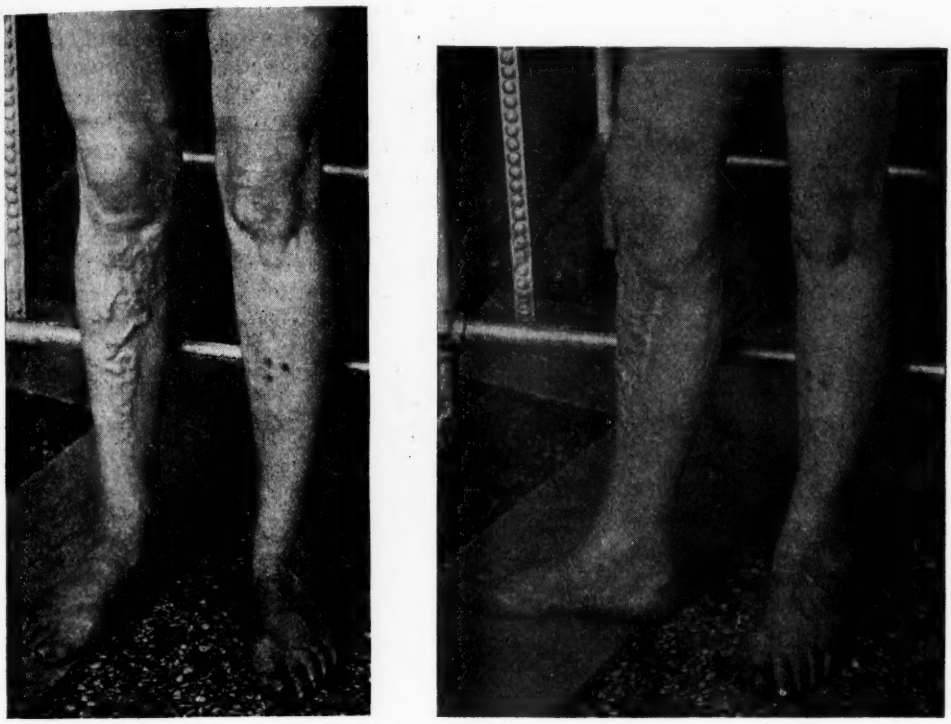
must be radical; it must obliterate the main saphenous column. This point, I feel, has not been sufficiently stressed by observers of this method. If only the distended veins of the lower leg are thrombosed, and the main trunk undisturbed, recanalization should occur. If it is impossible to inject the solution into the vein in the thigh, I favor the ligation and division of the vein close to the femoral, followed preferably by a subcutaneous stripping, down to a point below the knee joint. To repeat, only by obliterating or removing the main saphenous trunk can we hope to approach a cure. This attitude perhaps does not pertain to legs in which a few scattered veins are treated for the cosmetic effect alone.



CASE 2. Before—Involvement of long and short saphenous systems.



CASE 2. After—6 injections—60 c.c. 20% sodium chloride.



CASE 3. Before—2 operations within 10 years with recurrences.

CASE 3. After—8 injections—16 c.c. Quinine-urethane. Note where dilated vein in lower third of thigh has been injected. One injection—2 c.c.—at this point caused sclerosis of entire vein up to saphenous opening.

SOLUTIONS USED

In the present series of cases the sclerosing solutions used were as follows:—

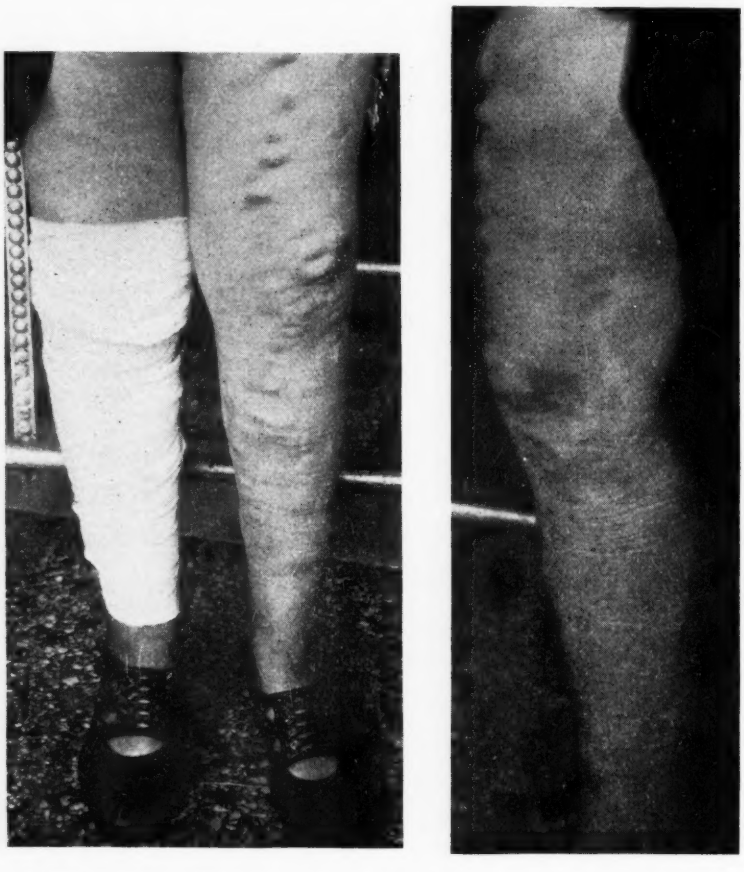
1.	Sodium Salicylate	20-40%
2.	Glucose Solution	50-66%
3.	Sodium Chloride	20%
4.	Quinine Hydrochloride	4 gm.
	Urethane	2 gm.
	Distilled Water ad	30 cc.

These four solutions have been most frequently employed by various recent investigators, and we have attempted in this sizable series to fairly evaluate the merits of each.

1. *Sodium Salicylate:* It is necessary to begin with a weak solution and work up to a stronger, on account of a possible susceptibility on the patient's part. This often results in a tolerance of the vein for the salicylate, making it needful to change to a greatly increased strength, or to some other solution. In addition, salicylate injections cause very severe muscle cramps, which come on immediately after administration, but subside within a few moments. Again, it is highly important that no solution, when injected, escape into the peri-venous tissues, since this results in a troublesome slough which is quite painful and may take a long time in healing.

2. *Glucose:* Its effect is quite uncertain; it does not seem to work uniformly; it frequently requires the injection of another solution. On the other hand, large quantities of glucose may be used at one sitting; there is no danger of soft tissue slough. It is, at worst, only slightly irritating and in those cases in which it works, it produces excellent results.

3. *Sodium Chloride:* I have used a 20% solution in a large number of cases, a 30% solution in a few. The stronger solution has been given up because it was found too irritating. In the weaker dilutions this solution works uniformly well. From 5 to 50 cc. may be injected at one sitting, depending usually on the wishes of the patient; 10 to 20 cc. is a good average. Sodium chloride, however, has the disadvantage of producing muscular cramps. These cramps come on immediately, radiate up and down the leg, often to the foot, and last about a minute. Again, as with the salicylate, tissue necrosis may occur if the salt escapes outside the vein. This is evidenced by an immediate, intense burning sensation at the site of injection, with a blanching out of the skin area involved. When this is detected, an immediate injection of normal saline solution into the spot will minimize greatly the subsequent slough. I advise, therefore, that this solution be used only in large



CASE 4. Before—Radical operation 6 years ago with recurrence in 4 years.

veins easy of entrance. Salt solution, however, is very efficient, producing a firm, hard thrombus or an immediate obliteration of the vein over a considerable segment.

4. *Quinine-Urethane:* This combination more nearly approaches the ideal solution for injection work. It causes no cramps and produces no tissue slough—in fact it may be introduced perivenously to obliterate networks of small veins so frequently seen about the ankle. Further, it exerts the desired irritating effect on the intima of the vein wall, with the subsequent production of an adherent thrombus. Its disadvantage lies in the idosyncrasy of patients to quinine and in the small amounts that can be used at each sitting, requiring numerous injections, therefore, to produce the desired result. I have had several patients who complained of severe backache following injections of 1 cc. of the quinine solution, and two patients in whom uterine bleeding occurred after the same amount. No more than 2 cc. should be given at the first sitting, and subsequently never more than 6 cc.

I consider a 20% sodium chloride solution in the large varices and the quinine-urethane combination in the smaller veins and in those accompanying ulcers the best agents for use at the present time.

CASE 4. After—6 injections—12 c.c. Quinine-urethane.

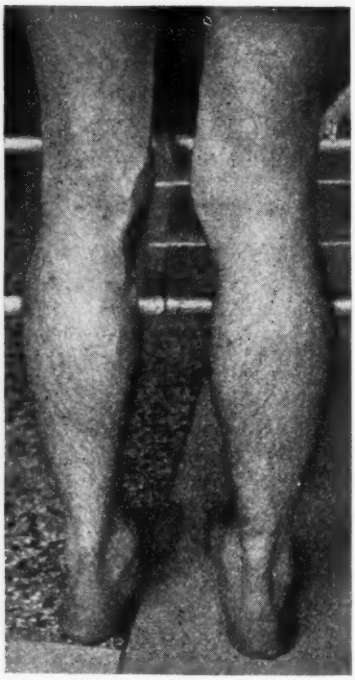
PATHOLOGY

The chemical solutions we have used have no coagulating effect directly on the blood, but have as their objective, irritation of the endothelium. The condition produced following injection, called "venitis" by the French, as distinguished from phlebitis, results in an immediate deposition of fibrin, which becomes firmly adherent to the surface of the injured endothelium. The thrombus permeates the vessel wall and becomes intimately incorporated with it, over the entire injured area. Segments of thrombosed veins removed after forty-eight hours show a clot that literally has to be torn from the vein with forceps, so firmly is it rooted in the vessel wall. This peculiarity of the post-injection clot is probably the biggest factor militating against the production of embolism. Further development in the evolution of obliteration is the organization of the thrombus, with eventual fibrosis,—the former soft varicosity shrinking down to a small, hard, fibrous cord. To quote Forestier on the differentiation between chemical venitis and bacterial phlebitis: "Venitis is localized, generates a very adhesive clot, does not give rise either to pain or to general edema of the limb, and leaves an atrophied cord. In phlebitis there is frequently an extension from

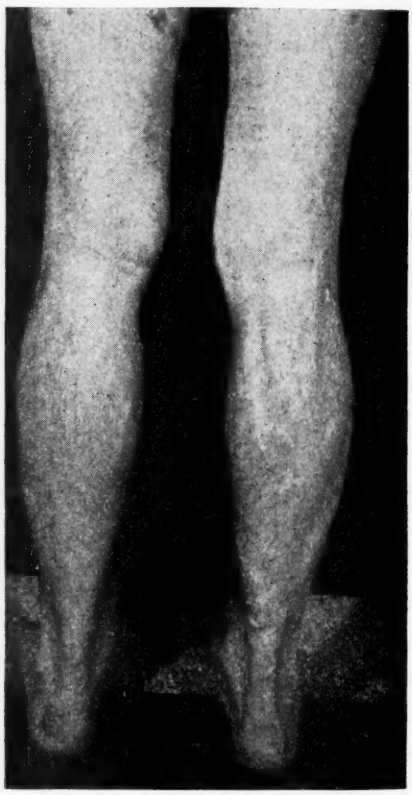
the superficial network to the deep lying network, causing edema of the limb; the clot is often loose and afloat in the blood; there is pain; atrophy does not take place; the vein remains hard and bulky, and further attacks of infection are possible. Phlebitis may give rise to embolism; venitis has positively no tendency to do so."

PREPARATION OF PATIENT AND TECHNIQUE

In the beginning, in practically all cases, we used the filling time test as a preliminary step in our treatment. This test is made by producing constriction in the upper thigh, with the veins emptied of blood, following elevation of the leg. The leg is then lowered and the patient stands up. If the veins below the point of constriction fill rapidly—within thirty seconds or less—it is thought to indicate involvement of the deep veins and incompetence of the valves of the perforating veins, resulting in regurgitation from the deep to the superficial system. This condition would, of course, contraindicate operation. The investigations of Barber and Shatara, however, have proved this test to be of little practical importance. They have shown by work on cadavers, by studies of venous pressure, and by clinical observation, that the filling time in the saphenous vein depends on the size of the vein, and the number of its branches; that the number of perforating veins is not constant, that the valves in these veins are often lacking and have been found to open both ways, therefore playing a very small part in the direction of the blood stream between superficial and deep vessels. Moreover, the history of a case, plus the appearance of the leg, are usually enough to give us the clue to a deep infectious thrombosis, without the aid of the filling time test. We, therefore, have given up this procedure except in those cases where there may exist any doubt as to the involvement of the deep venous system.



CASE 5. Before—probable congenital type of varicosity.



CASE 5. After—one injection—15 c.c. Sodium chloride.

The patient should be examined for the presence of any condition contraindicating injection. The leg is cleansed with soap and water and alcohol. No further preparation is necessary. A 10 cc. syringe (preferably the lock-control type), in the case of saline, and a 2 cc. syringe for the quinine salt are used. A No. 24 gauge needle has been found most satisfactory. With the patient sitting on the edge of the table, legs dangling, the veins are injected from the ankle upward, using 3-10 cc. of saline or 2 cc. of quinine-urethane at each injection. The injection should be made slowly, and repeated aspirations of blood done to insure the needle being within the lumen of the vein. This is important. No more than three injections should be made at one sitting. It is well to use a tourniquet when thigh injections are being given; this is not necessary when treatment is con-

fined to the leg, since the solution remains localized or gravitates toward the foot. Immediately following the removal of the needle from the vein, a sterile pad is placed over the site of the puncture and a firm bandage applied. A small collodion dressing is probably sufficient, but a firm dressing is much more comfortable.

SUBSEQUENT COURSE

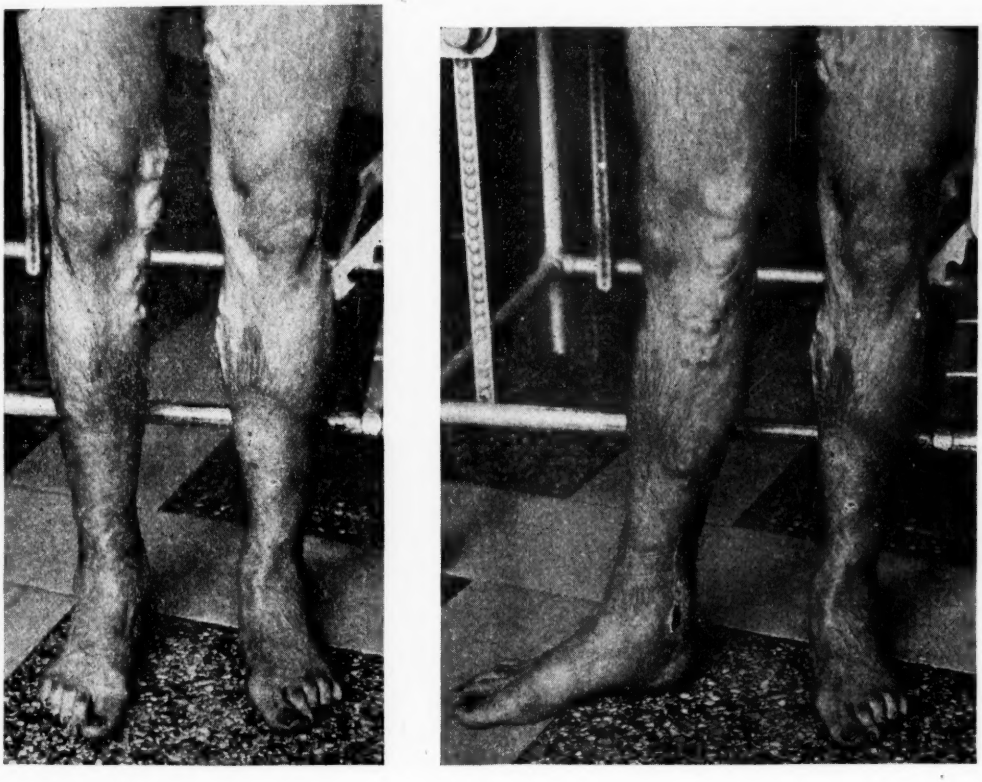
The patient reports in three or four days. At that time it will be noticed that the segment of vein affected—usually about 3 or 4 inches—has decreased in size, feels lumpy and tender, and the overlying skin is discolored, giving good evidence that the treatment is working. Not infrequently a marked phlebitis is present, which may ascend so rapidly as to be alarming. This most often happens when the vein in the thigh is injected. For this reason it is never judicious to inject higher than a point in the lower third of the thigh. The treatment of this phlebitis is rest, and ice locally. However, numerous times people are up and about working, with an apparently very severe local reaction of this type. It usually clears up within four or five days. As time goes on the "lumps" continue to decrease in size, lose their tenderness, and eventually disappear. The end result is a fibrous cord which feels like a lead pencil when rolled under the skin.

COMPLICATIONS

Cramps: When the salicylate or saline is used, cramp-like pains radiating up and down the leg, often felt worst in the foot, come on almost immediately following the injection, and last about a minute. They are often severe enough to make the patient feel faint. It is a wise precaution, therefore, to have him lie down after the solution has been administered. These cramps do not occur after the use of the quinine solution.

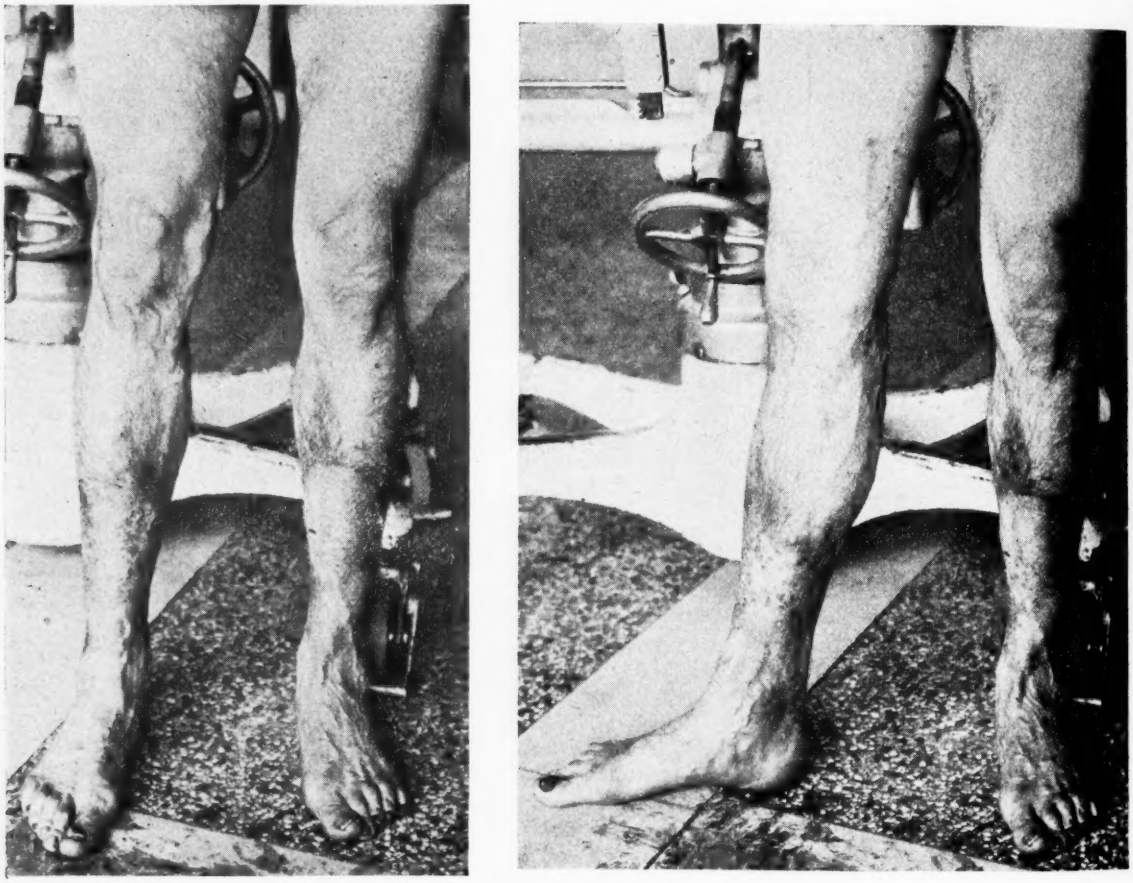
Necrosis: As has been mentioned above, a tissue slough will take place if salicylate or salt solution escapes outside the vein. This is perhaps surgically unimportant, but it is very troublesome to the patient and the resulting ulceration is obstinate in healing. If the quinine solution is used in the small varices and the saline in the larger, this complication will not ensue. We have not seen it since the early cases of our series.

Embolism: In the minds of most men this seems to be the greatest bugaboo in connection with the injection treatment. Certainly where any intravenous thrombus is produced, the possibility of embolism theoretically exists. But this does not work out in practice. McPheeters and Rice, in a review of 53,000 cases in the literature, found only 4 deaths due to embolism. In two of these, coagulating solutions were used,



CASE 6. Before—enormous varicosities with accompanying severe eczema of both lower legs, and painful ulcer posterior to internal malleolus right ankle.

the employment of which we do not advise. Such a low incidence of embolism certainly does not justify antipathy to the treatment on this basis alone. In my own series I have not seen the suggestion of embolism and, since 2480 injections were given, that would mean 2480 potential cases of embolism. I do not think that varicotomies can show an equally good record. The nature of the thrombus formation, which I have described, more than any other factor, accounts for the safety of the treatment. Again, with the patient in the upright position, the circulation in the varicose veins is reversed; in the horizontal position, the blood stream is directed centrally very slowly,—further aids in the prevention of embolism.



CASE 6. After—8 injections—80 c.c. sodium chloride; 3 injections Q. U. 6 c.c. (about ulcer). Note complete disappearance of ulcer. Healing took place one month after initial injection.

RESULTS

One hundred and fifty cases have been checked up. These include all types,—uncomplicated varicosities, varicose ulcers and eczema with accompanying veins, varices recurrent after operation, complicating constitutional disease, etc. All, without exception, have been improved. The most striking feature has been the improvement in clinical symptoms almost from the first injection: burning, itching, night cramps, easy fatigue. The decrease in size and obliteration of the veins is, after all, a secondary consideration, but an important one, particularly to women. In varices complicated by ulcers the results have been extremely gratifying. Where, heretofore, we have been merely scratching the surface in applying one of a dozen ointments in an effort to heal the ulcerated area, or occasionally operating to remove the veins leading into the ulcer, we now have a method which insures healing in a short time and in a more permanent fashion than any other. But the subject of ulcers demands a chapter by itself, not within the scope of this paper.

Suffice it to say, one cannot treat many of these cases without being impressed by the tremendous value of the procedure. To see, day after day, discouraged, crippled working people returned to their occupations, which they were compelled to give up on account the disability resulting from varicose veins, is to appreciate a factor of great social and economic importance.

CONCLUSIONS

1. 2480 varicose vein injections have been made on 410 patients.
2. The best solutions in use at the present time are 20% salt solution and quinine-urethane —distilled water.

3. The method is simple, safe, ambulatory, non-mutilating, and efficient.
4. 150 cases have been checked up with marked improvement in every instance.

BIBLIOGRAPHY

1 Linser, K.: Die Behandlung der Kramptaden mit intravarikosen Kochsalzinjektionen. Dermat. Wchnschr., 81: 1345-1351, (Sept. 12) 1925.
2 Meisen, V.: Injection Treatment of Varices and their Subsequent Condition. Ugeskrift for Laeger, 89:47-56 (January 20) 1927.
3 Humbert, L.: Les réactions inflammatiores à la suite des injections sclérosantes intravariqueuses. Hôpital, Paris, 15:17-78 (February, 1927).
4 Douthwaite, A. H.: The Injection Treatment of Varicose Veins. Second Edition. London, H. K. Lewis & Co., Ltd., 1928.
5 Barber, Robert F., and Shatara, F. I.: Thrombosis of the Deep Veins of the Lower Extremity. Jour. A. M. A., 90: 525-526, (Feb. 18) 1928.
6 Forestier, Jacques: Varices of the Lower Limbs. Jour. A. M. A., 90:1932-1936, (June 16) 1928.
7 McPheeters, H. O., and Rice Co.: Varicose Veins: Complications, Direct and Associated, Following the Injection Treatment: A Review of the Literature. Jour. A. M. A., 91: 1090:1094, (Oct. 13) 1928.

THE SPERMATOZOA COUNT

Its Value In The Diagnosis, Prognosis and Treatment of Sterility

BY DONALD MACOMBER, M.D., F.A.C.S.,* AND MORRIS B. SANDERS, M.D.*

ONE of the great difficulties in the diagnosis of sterility is the estimation of the fertility of the individual. In the case of the woman, such an estimation is, at best, a matter of conjecture, depending upon the experience of the observer. With the man, however, one can actually see and study the sex cells. The difficulty in the examination of the sex cells of the male has been to develop a technique that different laboratory workers could use with the probability of obtaining similar results.

Three methods have been used by other workers in estimating male fertility. One of the first methods is the use of the high power field. During the course of the examination of the semen, the number of spermatozoa per field is counted to make a rough guess at the percentage of the normal number present. This method is not accurate because of variations in the thickness of the drop of semen and in the magnification. Another method is that devised by Hühner[1]—the post-coital examination of the mixture of spermatic fluid with the vaginal and cervical secretions. The chief drawback to this method is that the semen is always diluted with the normal acid of the vaginal secretion. A third method is the measurement of head lengths of spermatozoa as devised by Williams and Savage[2] for bulls and adapted to man by Moench[3]. This method is based on sound scientific principles, but it is cumbersome and time consuming.

To meet these difficulties, we have employed since the fall of 1924, the method of counting the number of spermatozoa in a given volume of semen. The method is not original with us, but no one has used it extensively enough to establish a normal and to determine its practical value. In 1891, Lode[4] made extended observations with spermatozoa counts on a dog before and after the removal of one testis and on four men, one of whom had counts made at varying intervals. This investigation showed that counts ran fairly uniformly in the one case tested a number of times but there was great and unexplained difference between the counts of the various individuals. In 1910, Benedict[5] reported a previous count of a single examination of semen in a blood counting chamber (1902) and added another case. His article finished with the statement: "Enumeration of spermatozoa has seldom been practised. How useful either as an index of sexual or general health it is, is not yet known".

Our technique is as follows: A blood counting chamber and a white blood cell pipette are necessary. The diluent is a solution of five per cent. sodium bicarbonate to which one per cent. formalin has been added. The bicarbonate dissolves small amounts of mucus and the formalin is added to stop the activity of the spermatozoa. The semen is drawn up to the 0.5 mark on the pipette and then diluted with the bicarbonate-formalin solution to the 11 mark. The pipette is then thoroughly shaken to obtain a uniform mixture. A drop is placed on the counting chamber and the spermatozoa are counted in the same manner as in making a white cell count. After the number of spermatozoa in the millimeter square is determined, the following formula is used to compute the number of spermatozoa per cubic centimeters: Number in millimeter square x 10 (depth) x 20 (dilution) equals the number per cubic millimeter x 1,000 equals the number per cubic centimeter. The two chief sources of error with our technique are: in cases where there is an excess of mucus in the semen and in cases where it is observed in the preliminary examination under the microscope that the numbers are very low. The first may be corrected by diluting 1 cc. of semen with 19cc. of the bicarbonate-formalin solution, shaking thoroughly and counting without further dilution. The second may be counted directly in the counting chamber without any dilution whatever.

DISCUSSION OF RESULTS

What is a normal count? Our work as reported in this paper, is based on counts of 294 individuals.* The difficulty of establishing the normal count is that our data are based on ab-

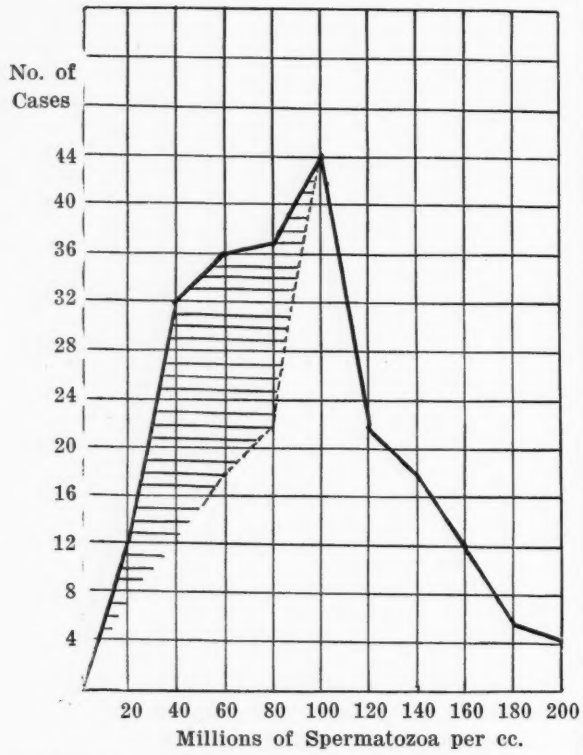
*For record and address of author see "This Week's Issue," page 1001.

*Further counts on 42 other individuals give similar results.

normal, as well as normal, men from the standpoint of fertility. To determine a standard of normality, we have plotted our results in the form of a curve (Table 1). In this table the

TABLE 1

FREQUENCY CURVE OF SPERMATOZOA COUNTS



This table is made up from counts of 271 individuals. The peak at 100,000,000 per cc. corresponds to the average finding in normal men.

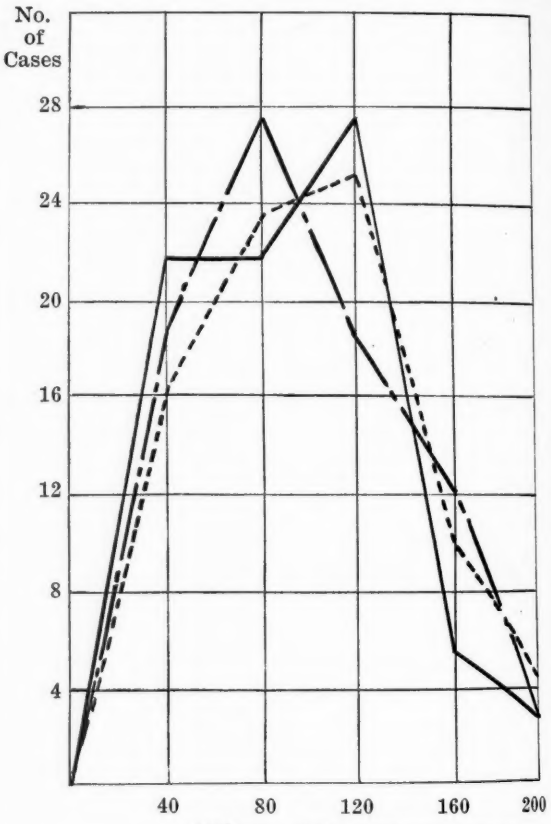
abscissae represent counts per 20,000,000 per cc. and the ordinates represent the number of individuals showing such a count. Of the 294 counts, some cases must be omitted; 16 cases of Aspermia are deducted because it is relative and not absolute sterility that we are studying in this paper; 7 cases of counts over 200,000,000 per cc. are deducted because the number of cases above that figure is so small that it will not influence the frequency curve. If the table is now studied with these facts in mind, it is seen that the largest number of cases in this series is around 100,000,000 per cc., which we can then assume to be a normal count. If it had been 294 normal individuals who had been studied, such a curve would show a sudden rise and a similar fall. We may conjecture that such a curve would have the form shown by the dotted line to the left of the peak but would have the portion of the curve to the right of the peak unchanged.

In our study of the semen, the number of cubic centimeters of semen has also been recorded. This will give the total number of spermatozoa in an ejaculation if multiplied by the spermatozoa count. It is our belief that it is the concentration of the spermatozoa per cc., rather than the total number, which is of importance in fertility. For this reason we are not tabulating these figures in this paper, but they will be reported at another time.

Do our counts show the relationship of age to fertility? We have made another table (Table 2) in which three curves are plotted: one repre-

TABLE 2

CURVES SHOWING RELATIONSHIP OF AGE TO FERTILITY



Solid line (————) 20-29 Age group.
Dotted line (- - - - - - -) 32-39 Age group.
Broken line (— - — - —) 40-49 Age group.

The curves shown in this chart are made up from the same figures as in Table 1. They have been separated into three groups according to age.

sents the age-group between 20 and 29; a second between 30 and 39 and the third between 40 and 49. Because of the fewer number of cases in each curve, these are plotted in units of 40,000,000 instead of 20,000,000 per cc. It will be seen that the curve representing the age-group of 40-49 has its peak at a definitely lower level (as regards numbers per cc.) than that of the other two groups, showing that fertility is lowered as age increases, although the lowering is gradual rather than sudden as seen in the fertility of women.

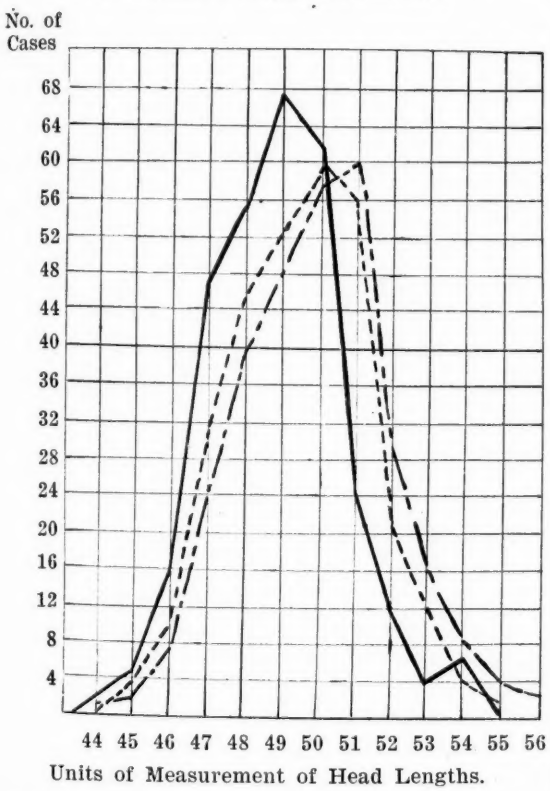
Is there any correlation between the sperma-

tozoa count and other indications of fertility? In estimating the fertility of a male patient, the size of the testes may be noted as a factor. Of late we have been measuring the longitudinal and transverse diameters of the testes and roughly computing their combined volume.* When comparing the counts with the volume of the testes in 135 cases, it is found, in spite of the presence of abnormal cases, that in general the testes of small volume are the ones with low counts and as the volume increases, the numbers are also higher. Williams and Savage[2] and Moench[3] have shown, the former, in bulls, the latter, in man, that the cases in which the majority of spermatozoa have head lengths of relatively uniform lengths are as a rule more fertile. We have prepared Table 3 to show the curves of the measurement of head lengths of spermatozoa in three cases of high fertility as determined by the sperm count. Table 4 shows similar curves of three cases of lowered fertility. The abscissae represent the unit of measurement in measuring the length of spermatozoa heads; the ordinates the number of spermatozoa showing such head lengths. Three hundred cells were measured in each case, the number adopted by Moench. Table 3 shows three curves, A, B and C. A represents a count of 174,000,000 per cc.; B a count of 112,000,000 and C a count of 96,000,000 per cc. It is seen that all the curves show a fairly rapid rise and fall, demonstrating that the large majority of spermatozoa head lengths were of relatively uniform size; it is also seen that the "spread" of the curves is not great. Table 4, on the other hand, in which curve A represents a count of 800,000 per cc.; B a count of 48,000,000 and C a count of 19,000,000 per cc., shows that there was a much greater variation in head lengths, a fact which Williams and Savage and Moench have shown is an important criterion in demonstrating low fertility in bulls and man. In these and other cases we have demonstrated that the spermatozoa count gives identical information as to fertlity as does the head length measurement. As a practical matter, it is obviously a far simpler test to perform and, for that reason, one which should have a greater usefulness.

What are the low limits of fertility? Upon examining the records of subsequent pregnancies, there have been only four cases in which

TABLE 3

MEASUREMENT OF HEAD LENGTHS OF SPERMATOZOA IN 3 CASES OF NORMAL FERTILITY

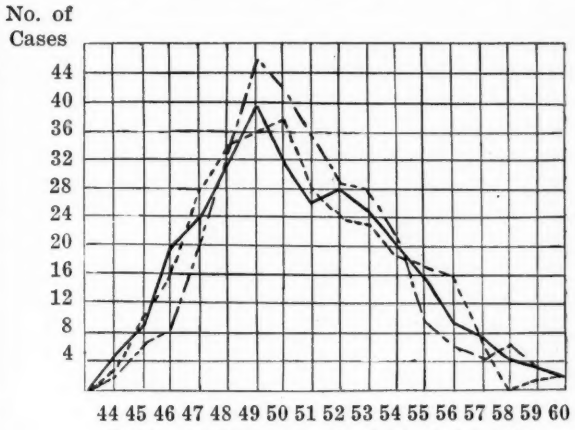


Solid line (————) (5348) Count 174,000,000 per cc.
Dotted line (- - - - - - - -) (3660) 112,000,000 per cc.
Broken line (— - — - —) (5839) 96,000,000 per cc.

Note the uniformity of head length measurements in all three cases as indicated by the narrow spread of the curves.

TABLE 4

MEASUREMENT OF HEAD LENGTHS OF SPERMATOZOA IN 3 CASES OF LOWERED FERTILITY



Solid line (————) (5867) Count 800,000 per cc.
Dotted line (- - - - - - - -) (5881) 48,000,000 per cc.
Broken line (— - — - —) (5835) 19,000,000 per cc.

Contrast this table with No. 3. These curves come from men of low fertility as shown by spermatozoa count. They show a far greater variability in head lengths.

*To do this we use the arbitrary formula $\frac{\pi D^2}{4} \times L \times K\ (0.9)$ for each testis and add the two results. D equals the diameter. L equals the length. K (0.9) is a constant used to correct for the fact that the testis is not cylindrical but ovoid in shape. K was arrived at experimentally.

there has been a pregnancy where the spermatozoa count was less than 60,000,000 per cc. One showed a count of 53,000,000 per cc. and a mild prostatitis was found. Treatment was recommended and carried out, but as the patient lived out of town and information of the pregnancy was learned only through correspondence, this case can not be correctly tabulated. A second had a count of 35,000,000 per cc. before treatment, prostatic treatment was advised and carried out elsewhere and 3 months later the wife became pregnant. A third had a count of 44,000,000 per cc. and was treated in another city with a report from his doctor as to improvement, but a second count was not made. The fourth case had a count of 12,000,000 per cc.; three months later he had two treatments, but failed to come in for further treatment and 2 months later his wife became pregnant and was delivered of a normal baby. In none of these cases, therefore, have we any data as to how fertility and the sperm count may have been affected by treatment before conception occurred. There were seven other pregnancies with counts between 60,000,000 and 70,000,000; five pregnancies between 70,000,000 and 80,000,000. Above 80,000,000 per cc. there were thirty-six pregnancies. These figures would seem to show that although pregnancy is not impossible with a count below 60,000,000 per cc., the chances are slight without an increase in numbers. With counts over 60,000,000 per cc. the chances of pregnancy are correspondingly increased if all other factors are favorable.

The spermatozoa count has proved to be of importance not only in the diagnosis of fertility but also in gauging the effect of treatment. When a diagnosis of lowered fertility due to a low spermatozoa count has been made, this count serves as a standard for that patient. After the treatment of the cause of the lowered fertility has been carried out, a second examination of the semen with another spermatozoa count readily shows us, or even a different observer, what improvement has been made. Just what the interrelationship is between the function of the prostate and the testes has not yet been fully worked out, but in the majority of cases that we have seen, where there has been a prostatitis with its accompanying devitalizing effect on the spermatozoa, there has also been a lowering of the count. Treatment of the prostatitis has in many cases not only improved the vitality of the spermatozoa but has increased the count up to a point where pregnancy has been possible.

One case may be quoted to illustrate the effect of treatment on the spermatozoa count. The patient showed nothing wrong physically except for a bilateral varicocele. The count was 20,000,000 per cc. A three months' out-door vacation failed to improve the count. He finally consented to have an excision of his bilateral varicocele and five months later the count had risen to 73,000,000 per cc. His wife became pregnant and was delivered at term. At the present time another pregnancy is proceeding normally.

CONCLUSIONS

In summarizing our report we may state that the spermatozoa count has proved a useful guide to fertility. It is a simple test and can be performed easily and accurately. In our experience repeated tests run quite uniformly. It seems to be equally as accurate as head length measurement and is far simpler to do. It is helpful in diagnosis, prognosis and as a gauge of the efficacy of treatment.

BIBLIOGRAPHY

1 Hühner, Max: Sterility in the Male and Female, New York, Rebman Co., 1913.
2 Williams, W. W., and Savage, A.: Observations on Seminal Micropathology of Bulls. Cornell Veterinarian, Oct., 1925.
3 Moench, G. L.: Some Phases of the Problem of Sterility. Med. Herald and Physiotherapist, March, 1928.
4 Lode, Alois: Untersuch. uber die Zahlen und Regenerationsverhaltnisse der Spermat. bei Hund und Mensch. Archiv. für die Gesammte Physiol., Vol. L, p. 278, 1891.
5 Benedict, A. L.: Enumeration of Spermatozoids. N. Y. Med. Journ., 91, p. 1169, 1910.

A REVIEW OF THREE HUNDRED CONSECUTIVE SURGICAL CASES WITH SPECIAL REFERENCE TO POST-OPERATIVE PULMONARY COMPLICATIONS

BY HORACE K. SOWLES, M.D., F.A.C.S.*

THIS is a statistical report of three hundred consecutive personal cases from the surgical service of the Lawrence Memorial Hospital in Medford, with special reference to pulmonary complications. About forty additional cases have been discarded because they involved relatively minor procedures, such as blood transfusions, drainage of abscesses, excision of lipomata, etc. There were no complications in any of the discarded minor cases. One point of interest in this group lies in the fact that they represent a fairly typical series of admissions to a general hospital. Many of them were routine cases, but, on the other hand, many were in a desperate condition and a few were distinctly unusual. One hundred and eighty-eight, or 62 2/3%, were classified as emergencies; that is, they were operated on as soon as feasible after their admission to the hospital, the operative procedure being a matter of necessity rather

*For record and address of author see "This Week's Issue," page 1001.

than choice and thereby excluding any special pre-operative observation or preparation. The list of diagnoses is as follows:

Acute appendicitis	116
Chronic appendicitis	18
Fibroid tumor of the uterus	15
Cholelithiasis and cholecystitis	14
Subacute appendicitis	14
Inguinal hernia	12
Open reduction of fractures	9
Gynecological repairs	9
Ruptured ectopic pregnancy	8
Acute empyema	8
Acute intestinal obstruction	7
Chronic pelvic inflammation	6
Multiple nerve and tendon suture	5
Acute perforation duodenal ulcer	5
Compound fractures	4
Traumatic amputation of fingers and toes	4
Strangulated hernia	4
Ruptured viscus	4
Excision of carbuncle	3
Peptic ulcer	3
Septic hand	3
Carcinoma of the sigmoid	3
Lysis of abdominal adhesions	3
Carcinoma of the breast	2
Septic foot	2
Ischiorectal abscess	2
Fistula in ano	2
Thyroidectomy for Graves' disease	2
Cystotomy for acute retention	2
Chronic cystic disease of breast	1
Carcinoma of the stomach	1
Cervical abscess	1
Acute perforation of abscess of the omentum	1
Splenectomy for purpura hemorrhagica	1
Radical cure of hydrocele	1
Closure of diaphragm in diaphragmatic hernia	1
Removal of safety pin from stomach	1
Dermoid cyst of ovary	1
Amputation of leg for gangrene	1
Traumatic amputation of leg	1

The ages of these patients ranged from 9 months to 82 years. The average age was 29 years. The kinds of anesthetics used were as follows:

Ether	285
Local (novocain 1%)	11
Ethylene	2
Spinal (novocain C)	1
Gas-oxygen	1

Another most interesting fact about this group of cases is that there were no respiratory or pulmonary complications. I feel that the administration of the hospital certainly should receive some credit for their absence inasmuch as careful nursing care immediately following an operation is, in my opinion, one of the factors in precluding post-operative pulmonary complications. Certainly only a minor portion of the post-operative respiratory infections and pneumonias are due to ether, because they occur with almost equal frequency in patients who are operated on under local or spinal anesthesia and in those to whom ether or the other inhalation anesthetics are given. In this particular group of two hundred and eighty-five, ether was given by ten or twelve different men, none of whom practice anesthesia as a specialty and in this group also were a large percentage of emergency patients who did not have the opportunity to receive any pre-operative preparation for ether. If ether was the all-important factor in respiratory complications, we would naturally expect a more perfect record in a series of patients who had been carefully prepared for ether and the anesthetic administered by a single person or small number of persons who are specialists in anesthesia. The above group, however, shows that this assumption is not necessarily true.

In the following brief resumé, I am particularly referring to those pulmonary complications which occur within the first seventy-two hours following operations since those which occur after this period are very likely due to pulmonary embolism and infarction, questions leading us off into an entirely different line of thought. There are undoubtedly several more or less definite and more or less recognized contributing causes to these post-operative pulmonary complications. The degree of importance of these various factors and the exact physiological mechanics by which they lead up to the unfortunate end result may well be a subject for prolonged and intricate discussion. I will enumerate some of the more obvious factors, with a very brief conclusion.

Chilling of the patient during operation, during transit back to the wards, or during recovery should be carefully avoided. At this time the patients are often imperfectly covered or imperfectly clothed and often bathed in perspiration. Combined with this the thermic centers may be definitely out of balance, either due to the anesthetic or to the shock and strain of operative procedures so that the body fails properly to conserve its normal heat and is, therefore, particularly susceptible to cold.

The location of the operation also seems to have a very definite relation to the frequency of pulmonary complications, though this relation is probably an indirect one such as interference with the movements of the upper abdominal and intercostal muscles and secondary limitation of the excursion of the diaphragm. It bears, as well, on the degree of surgical shock, which is recognized as greater in the upper abdomen, possibly due to a richer supply of nerves and blood vessels. Some authors report the incidence of pulmonary complications as high as twelve or thirteen per cent. in upper abdominal operations, four to five per cent. in pelvic operations, and around two per cent. for all cases including operations on the extremities. The Trendelenburg position may possibly be a factor in reducing the percentage which occurs in pelvic operations but probably is not the chief factor.

Age and sex are apparently unimportant, but general health and nutrition seem to be of moment, which may be the reason why general hospitals whose patients are among the poorer classes have a higher incidence of these complica-

tions. The presence of pulmonary disease or infection prior to operation is also a probable factor. One author definitely objects to high spinal anesthesia on the theory that disturbance of nerve function in the dorsal region can produce broncho-pneumonia.

From all these theories and discussions there seems to be a fairly definite conclusion; namely, that any one of several groups of possible contributing causes may produce a lack of proper expansion and contraction in certain portions of the periphery of the lungs and a slowing up of the circulation, followed by congestion and edema so that the bronchioles are more or less choked by the swelling of their walls. This local condition is possibly increased from irritation of the anesthetic, or from reflex or painful limitation of the muscles of respiration, or is due to the fall in blood pressure, which, in turn, is influenced by loss of blood, shock, position of the patient, or the chilling effects of abnormal loss of body heat. Then into this motionless, well-nourished area of lung tissue, bacteria arrive either by way of the air, blood, or lymph, and aided by the lowered resistance of the patient, may cause a bronchitis or pneumonia.

Therefore, to prevent or diminish the frequency of untoward sequelae, we should do everything possible to avoid those things which can produce such a slowing of the peripheral pulmonary circulation. A careful choice should be made as to the anesthetic to be used. Surgical shock should be avoided, which means the avoidance of unnecessary prolongation of the operation, unnecessary trauma, and unnecessary loss of blood. Body heat should be carefully conserved during and immediately following operation. Finally, the additional suggestions are made that operative position of the patient may have some influence on surgical shock; that transverse upper abdominal incisions cause less embarrassment to the muscles of respiration; and that if the post-operative patient is promptly turned on his side when he arrives back in bed, this necessarily entails considerable movement of the arms and legs and has a beneficial stimulating effect on both the general and peripheral circulation. This position also allows a more free exchange of air and a more complete expansion of the lower lungs. The routine use of this position in bed, I believe, will alone diminish the incidence of the immediate post-operative pulmonary complications as well as the frequency of thrombosis and embolism.

There were six deaths in this group of 300 (2%) and a brief summary of each fatality is appended that you may judge the degree which the surgical procedures may have contributed toward the end result.

1. C. W., female, aged 62. Admitted January 13, 1926. The patient sustained a long oblique fracture involving the middle third of the left humerus as the result of an automobile accident. Two attempts at closed reduction failed to give satisfactory position. Two weeks after admission to the hospital, an open reduction of this fracture was done under ether and a Parham band applied, by which an excellent position of the fragments was obtained. The wound healed normally. The course of the convalescence was uneventful for two weeks after operation, when the pulse began to be very irregular. The extreme variations in pulse rate were from 50 to 150. This condition was accompanied by attacks of fainting spells. The patient was treated by the medical service with temporary relief, but finally died of cardiac failure 29 days after the operation.

2. F. W., female, aged 49. Admitted January 6, 1927. This patient was admitted to the medical service with a diagnosis of lobar pneumonia. The temperature came down gradually and then gradually climbed again for one week. At that time an x-ray was taken and a thoracentesis was done. Pus was obtained by this exploratory tap. A trocar thoracotomy was then performed under local anesthesia which was followed by a temporary drop in temperature, but the temperature rose again in the course of a week to a still higher level. Nine days after the thoracotomy was done, a rib was resected under local anesthesia, following which the temperature and pulse dropped to normal for two days, and then rose again rapidly accompanied by a development of meningeal symptoms. The patient died six days after the rib resection of pneumococcus meningitis.

3. W. N., a boy of 4 years, admitted September 9, 1927. Diagnosis: acute appendicitis with peritonitis. The patient had a temperature of 101, pulse 130, respirations 40; white count 26,000. On physical examination this child evidently had a very severe inflammatory process in the abdomen and was in an extremely critical condition. He was operated on at once under ether. The appendix was very high in the right side, behind the cecum, nearly up to the liver. It was gangrenous and perforated and accompanied by an extensive peritonitis with practically no evidence of any attempt at walling off the spreading infection. Appendectomy with drainage was done. The patient died at the end of ten hours.

4. A. S., female, aged 68. Admitted December 31, 1927. This patient was brought in in a condition of very severe shock following an automobile accident. She had multiple contusions and abrasions, multiple lacerations of the scalp, a badly comminuted fracture of the right lower leg involving the knee joint, ? of fracture of the skull, ? of intra-abdominal injuries. She recovered somewhat from her original condition of shock, but the abdomen remained very tender and extremely rigid and in spite of her critical condition, we felt it necessary to open the abdomen the next morning. This was done under local anesthesia. The pelvis was found to be filled with blood, which was rather foul smelling, and a large rent was found in the mesentery of the ileum. The rent, however, was not bleeding at the time of operation. A cigarette drain was placed in the pelvis and the abdomen closed. The patient died at the end of 24 hours.

5. W. M., male, aged 65. Admitted October 18, 1928. The patient appeared to be much older than his given age of 65 years. He was sent in with a diagnosis of strangulated left inguinal hernia. He had a greatly enlarged heart with chronic mitral regurgitation. Operation was performed at once and under local anesthesia. The hernia contained small bowel which, however, was perfectly viable. The hernia was repaired in the routine Bassini method. However, the patient continued to vomit and the next day became irrational. He continued irrational during the following week, although the temperature

remained perfectly normal. His pulse was very irregular. He gradually became weaker and died of cardiac failure 8 days after the operation.

6. A. S., male, aged 22. Admitted June 7, 1928 with very severe acute purpura hemorrhagica. At the time of admission the red blood count was 967,000 and the white blood count was 2200; hemoglobin 45%. By a series of transfusions we managed to bring his red count up to 2,000,000 and on July 5th a splenectomy was done. Neither the transfusions nor the splenectomy, however, seemed to have the desired effect as regards stimulating the blood-forming mechanisms. The patient gradually went down hill and died August 13, 1928, a little over two months after his admission.

TRAUMATIC SUBASTRAGALAR ARTHROPATHY

A Clinical Entity. A Preliminary Report*

BY DENIS S. O'CONNOR, M.D.†

INTRODUCTION

A FERTILE territory for discovery still exists in the human body. Each new invention which contributes to refinement of diagnosis makes a review of the whole field of medicine desirable in the light of the new methods of examination. The Roentgen ray, in a positive way, revolutionized the study of disease and each improvement in Roentgen ray technic further corrected our conceptions of diseased conditions. As the positive findings of Roentgen rays became less remarkable, the negative findings assumed greater importance.

Before the advent of the Roentgen ray machine an injury to the heel either was a fracture of the os calcis or it was not. The roentgenogram helped us to determine definitely whether or not a fracture was present. In many cases where the roentgenogram did not show a fracture, the subsequent disability was in many cases as great as in those cases where a fracture was found to be present. Then it was found that, following fracture of the os calcis, the cause of persistent pain, even after satisfactory healing of the fracture, was due to the associated injury to the subastragalar joint and the modified operation of subastragalar arthrodesis was extended to meet this problem[1].

The fact that a severe degree of injury to the subastragalar joint could take place without fracture of the os calcis seems to have escaped notice in the consideration of the possibility of bone pathology. I am convinced, from a careful study of the few cases that I have seen, that traumatic subastragalar arthropathy does occur unassociated with fracture of the bones entering to the formation of that joint.

STRUCTURE AND FUNCTION

The subastragalar, or astragalo-calcaneal joint, is formed by the contact of the inferior surface of the astragalus and the superior surface of the os calcis. Each bone has two distinct articular facets and on each bone is a diagonal groove separating the articular facets. A very strong ligament, attached in the opposing grooves, holds the two bones in rather close contact. If the two articular facets on each bone could be considered as one, the resulting surface would be an undulating concavo-convex one. It is a joint that of necessity admits of very little motion about an axis transverse to the long axis of the foot. The principal motion in this joint is about a horizontal axis in the long axis of the foot. The movements of inversion and eversion of the foot, in which this joint plays its greatest part, are not movements performed solely in the subastragalar joint and it is difficult to measure the exact part of the function accomplished through this joint. The lateral ligaments of the subastragalar joint are essentially the continuation of the lateral ligaments of the ankle joint, and the other ligaments, excepting the astragalo-calcaneal ligament, which has been mentioned, are unimportant for the purpose of this paper. It is important to remember, in considering this joint, that the tendo Achilles of the powerful gastrocnemius muscle has its insertion on the posterior surface of the os calcis and that the posterior attachment of the plantar fascia is on the inferior surface of the os calcis.

It is the functioning of this joint that permits one to maintain an upright position of the body while walking on uneven surfaces and it is of great importance for any work involving fineness of foot work.

ETIOLOGY

Traumatic subastragalar arthropathy, in all the cases I have seen, except one, has been the result of a fall or jump from a pole or other high structure, to the ground or hard surface, the injured person landing squarely on the feet.

SYMPTOMS

It must be obvious that following such an accident, it would not be possible for the injured person to immediately and definitely localize the injury even if uncomplicated. If uncomplicated trauma to the subastragalar joint has occurred, however, the injured person, within a short time, complains of pain in the region of the heel and ankle and walks in a guarded and stilted manner, if at all, and with obvious pain. Walking on uneven surfaces is very painful as is also stepping on small loose stones.

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SIGNS

Examination of the injured foot in uncomplicated cases will usually disclose little, if any, swelling about the heel or ankle. Marked tenderness on deep pressure over the subastragalar fossa and along the joint line laterally has been a constant finding in the cases studied. In the more severely injured cases tenderness may be elicited along the joint line medially. Pain on hammer percussion of the heel is present but is not pathognomonic in the acute stages because of the inevitable concomitant contusion of the soft tissues beneath the os calcis. Rising on the ball of the foot is either impossible or performed with great difficulty and much pain. Active lateral motion of the foot is painful before the limit of motion is reached.

DIFFERENTIAL DIAGNOSIS

Traumatic subastragalar arthropathy must be differentiated from fractures of the tibia and fibula at the ankle, fractures of the astragalus, fractures of the os calcis, sprained ankle, chronic synovitis of the peroneal tendon sheath, policeman's heel and rupture of the tibio-fibular ligament.

Proper Roentgen ray examination should rule out any of the above fractures. A sprain of the ankle is commonly the result of the continuation of a violent force acting upon the external lateral ligament of the ankle when the foot is already inverted to the functional limit. The external lateral ligament is the principal structure damaged and the injury is usually attended by great swelling due to the tearing of small blood vessels and consequent subcutaneous hemorrhage. In sprains, the motion which causes pain is that which puts the external lateral ligament on stretch, while in subastragalar arthropathy, pain comes on before the external lateral ligament is put on tension. Under ordinary protection, a sprain will clear up in three or four weeks, and after that time pain is not a disabling factor, while in traumatic subastragalar arthropathy, pain is present for months and is a disabling factor. Chronic synovitis of the peroneal tendon sheaths is distinguished by a thickening of the tendon sheaths and a history of frequently "turning the ankle" without sufficient apparent cause. In "policeman's heel" the tenderness is definitely located on the inferior surface of the os calcis and is accompanied by a history of prolonged walking on an unyielding surface. Rupture of the tibio-fibular ligament is determined by spreading of the ankle mortise, and can be determined clinically and by roentgenogram.

CASE REPORTS

CASE I. L. S., age 33 years, a lineman, was injured on December 20, 1922, when a pole on which he was working broke off near the base and fell to the ground taking him with it. The end of the pole struck an automobile first, thus preventing the pole from crushing him beneath it. When the end of the pole struck the automobile, the jar wrenched his feet loose from the pole while his safety belt held his body, and his feet struck the ground with great force. The distance of the fall was about twenty-five feet.

The patient was brought to my office complaining of pain in both feet. Examination disclosed tenderness about the heel of the left foot and instep of the right foot. Roentgenograms of the right foot showed divulsion of the great toe, first metatarsal bone and internal cuneiform bones of the foot. Roentgenograms of the left foot were negative for gross injury.

The right foot was strapped in an endeavor to overcome the divulsion, the patient was given crutches and advised to use hot moist heat on the left foot. On subsequent examinations of his left foot, his pain was consistently located to both the medial and lateral aspects of the subastragalar joint.

On January 8, 1923, a foot plate was fitted to the left foot and on January 22nd the patient was advised to return to light work. By February 4th no improvement had occurred and on February 15th the foot was examined by an orthopedic consultant who found "local tenderness on the superior surface of the os calcis at its junction with the posterior surface of the astragalus. No limitation of lateral motion of the foot, no limitation of flexion or extension at the ankle and no swelling." He considered the roentgenograms to be negative and did not think any treatment was indicated as the outlook for complete recovery was, he believed, good.

Following orthopedic consultation, the patient came to the office at frequent intervals, although we were unable to do anything further for him.

On May 24, 1923, the foot was re-examined by the orthopedic consultant, who found the patient to be still complaining of pain behind the left ankle. Roentgenograms were taken and considered to be negative. The consultant said that the patient was neurotic and fully able to do any kind of work. He was then placed under the care of a neurologist, who treated him locally with radiant heat and electrical modalities until October 25, 1923, when he again reported to my office, no better than before.

Next he came under the care of a skilled physiotherapist, who treated him until January 1924, when, in his opinion, maximum improvement had been reached, although the patient still had pain in the heel on walking.

About four months later, May 13, 1924, his teeth were x-rayed for possible sources of infection, but were found to be negative. He was still coming to the office, complaining of pain in left heel, in January 1925. New roentgenograms taken at that time failed to yield any information. When last heard from, November 1, 1928, the patient had never been able to go back to his old job as lineman but was employed as a clerk in a store.

CASE II. G. L., 30 years old, colored, a hod carrier, was injured July 7, 1926, when he stepped on the end of a loose board, which tipped up and allowed him to fall fifteen feet to the floor below, landing on his feet. The physicians who attended him reported his injuries as a sprain of the left ankle and contusions of the chest and right elbow. After five weeks of treatment by rest, adhesive plaster dressing to the heel and hot moist heat compresses, he returned to work under protest. Roentgenograms of the ankle and foot were negative for bone injury.

He was sent to me for orthopedic examination ten weeks after his injury because the attending surgeon had become disgusted with him and could do nothing more for him. His chief complaints at this time were pain in the back and lateral aspect of the left ankle and heel on walking and stiffness in damp weather.

Examination showed a slender, very angular and loose-jointed colored man. The feet were pronated and the longitudinal arches completely broken down. He had definite tenderness on pressure over the subastragalar fossa and the joint line laterally. He was able to rise on the ball of the foot only with difficulty and the effort was painful.

His employers refused to grant him further treatment and he engaged treatment at his own expense, but on January 15, 1927 he was still having pain in his left heel.

CASE III. W. S., 33 years old, a cableman, was injured in September, when he fell twenty feet from a pole landing on his feet and then fell over backwards. He complained of pain in his right heel. I saw him four days after his injury. He had tenderness on pressure over the joint line laterally and attempts to rise on the ball of the foot were painful. Roentgenograms were negative for gross injury to the foot. Four weeks later the pain had cleared up.

CASE IV. J. H. S., 54 years old, electrician, No. 63070, entered the hospital on January 30, 1928 with complaint of pain in right ankle, which had been present since injury of July 1926. At that time he had slid down a pole at a distance of thirty-five feet, striking his right foot on a mail box. He was taken to the hospital, where roentgenograms of the heel were found to be negative for fracture of the os calcis. He was permitted to leave the hospital after twenty-four hours, but had had physical therapy of various kinds continuously since that time without benefit.

During the past eighteen months, the pain had been intermittent. Walking on uneven surfaces caused the pain to recur and it did not recede for three to six weeks. Walking on smooth surfaces was not very painful but the slightest turning of the ankle, such as might be caused by the rolling of a small stone under the foot, causes severe pain.

Examination showed some swelling about the heel and ankle. Tenderness was present on pressure over the lateral joint line, subastragalar joint. There was no limitation of motion and no pain on motion without weight bearing.

Operation: Incision was made on the lateral aspect of the right foot extending from just below and behind the external malleolus, carried forward for a distance of six centimeters and then upward for a distance of four centimeters. The subcutaneous tissues were divided, retracted and the subastragalar joint exposed. With osteotome and mallet, the cartilaginous surfaces of the joint were removed. The wound was closed with chromic catgut and black silk. A plaster-of-Paris boot was applied with the foot in neutral position.

The patient made an uneventful recovery from the operation. Subsequent examination showed a good result with relief of pain.

CASE V. T. M., 38 years old, steam shovel operator, was referred to me on October 5, 1927 for pain in the right foot following an injury on August 6, 1926. On that date his foot was caught in a cable and he sustained a badly comminuted fracture of the tibia and fibula. He was taken to a hospital and treated for the fracture with excellent results. He returned to work as night watchman but suffered greatly from the pain in the right foot.

Examination: The patient walked with a distinct limp. Analysis of the limp revealed the fact that the man was not putting right heel on the ground. While there was a slight amount of shortening of the heel cord, it was considered insufficient to account for the failure of the heel to touch the ground. The fracture of the tibia and fibula had healed in good position and alignment. Dorsiflexion of the right foot was slightly limited but not painful. Eversion of the foot was painful, with the pain referred to the outer side of the ankle region. There was tenderness on pressure over the lateral line of the subastragalar joint and fossa. Hammer percussion of the heel caused pain in the subastragalar joint. The patient volunteered the information that walking on uneven ground or stepping on a loose stone caused severe pain in the heel. He was able to rise on the ball of the foot only with difficulty and then with most of his weight on the left foot.

Operation was advised but refused by his insurance company, who settled the case on the basis of the findings in this examination.

PATHOLOGY

Only one of the five cases was operated upon, the tissue pathological report of which was as follows:

"CASE IV—J. S. No. 6688. Operator—Dr. Phelps. January 31, 1928.

Gross:

1. Top of os calcis. Several small bony fragments, none larger than 1 cm. in greatest diameter and several much smaller. No definite necrosis can be made out.
2. Bottom of astragalus. Several small bony fragments, the largest of which is 1.5 cm. in length. One piece is definitely yellow in appearance; the others are slate grey.
3. Bottom of os calcis. Spongy curettings of bone about 1 x .5 cm.

Microscopic:

1. The fragments consist chiefly of hyaline cartilage whose cells are well preserved. To several fragments are attached small portions of dense, acellular fibrous tissue.
2. One side of the largest fragment of the astragalus is covered by well preserved hyaline cartilage, and the other side by dense fibrous tissue. The bone itself no longer has normal architecture but is represented by an amorphous granular, dark staining material, suggestive of necrosis. Occasional marrow cells scattered in this amorphous material are sufficiently well preserved to be identifiable. Large amount of old blood pigment, golden yellow in color, lie scattered through the necrotic bone.
3. These curettings are composed of fragments of hyaline cartilage in an excellent stage of preservation.

Final Diagnosis:

Necrosis of astragalus. (Dr. Zimmerman.)"

While the tissue report here seems to indicate that the joint cartilage was approximately normal, it also showed definitely that the internal bone structure of the os calcis had been damaged and that repair had not completely taken place eighteen months after injury. It seems probable that some of the milder forms of damage to the joint cartilage such as fibrillation of the cartilage[1] takes place in injuries of the type reported here. The microscopic findings in this case correspond to the findings of Smith-Peterson and Rogers in traumatic sacroiliac arthritis[2].

PROGNOSIS

Pain in the joint with consequent disability for work involving weight bearing is likely to be of long duration. In one of the cases studied, the pain had cleared up in about three weeks, in another case the pain was still present after

six months but the patient had resumed employment under protest, while in the third case pain was still present after three years and the patient, unable to resume his former employment, was doing light work. One case was settled by the insurance company rather than accept the hazard of operation. One case had a subastragalar arthrodesis with relief of pain.

TREATMENT

Conservative treatment by immobilization of the foot in a plaster-of-Paris cast, prohibition of weight-bearing, and attention to general hygiene are justified in all cases. With no means of determining the degree of damage to the joint and the patient's recuperative powers, radical treatment, which means arthrodesis of the subastragalar joint, is not justified. Immobilization should be maintained and weight-bearing absolutely prohibited for at least six weeks. Physiotherapy, designed to improve the active circulation in the foot and heel, should be helpful, but passive congestion, which so frequently results from the use of dry heat and light treatments seems to impede recovery.

DISCUSSION

The cases herewith reported, corresponding rather closely in etiology, symptoms, signs and roentgenographic appearance, would seem to represent a definite clinical condition hitherto undifferentiated. The clinical course of the above cases would seem to show that they are productive of long disability. The conservative treatment seems to be unsatisfactory in most cases. The pathological study of tissues removed from one patient showed changes which have also been found in other joints following trauma.

While a study of five cases is not a sufficiently large number from which to draw definite conclusions, I believe that the similarity of signs and symptoms and the apparent failure on the part of good clinicians to recognize and classify the condition are adequate grounds for placing this report before the profession in the hope that further case reports will show the condition to be not uncommon, and that a sufficiently large number of case studies will be furnished upon which to base proper treatment.

SUMMARY

Traumatic subastragalar arthropathy would seem to be entitled to a designation as a definite clinical entity. Uncomplicated trauma was the etiology in all the cases studied.

The symptoms of the condition are:

1. Pain in the heel on weight bearing.
2. Inability to walk on rough ground without pain in the region of the heel.

The signs of the conditions are:

1. Tenderness on pressure along the medial, lateral or both aspects of the subastragalar joint lines.
2. Pain in the subastragalar joint on hammer percussion over the heel.
3. Pain in the subastragalar joint on attempting to rise on the ball of the foot.
4. Pain on lateral motion of the heel.

The condition can be differentiated from other common affections about the heel and ankle by roentgenograms. The changes in the tissues about the joint are similar to those encountered in traumatic arthritis in other joints.

The prognosis for recovery without pain is not good under conservative treatment. Subastragalar arthrodesis is advisable in cases not free from pain after three months.

REFERENCES

1 P. D. Wilson: Treatment of Fractures of the Os Calcis by Arthrodesis of the Subastragalar Joint. J. A. M. A., LXXXIX, 1676-1682, Nov. 12, 1927.

2 M. N. Smith-Peterson and Wm. A. Rogers: End Result Study of Arthrodesis of the Sacro-iliac Joint for Arthritis, Traumatic and Non-traumatic. J. B. and J. Surg., VIII, 18, January, 1926.

THE ABUSE OF DRUGS IN CERTAIN PSYCHOPATHIC STATES—WITH REPORTS OF A FEW CASES

KENNETH J. TILLOTSON, M.D.*

FROM observation and experience in dealing with a large number of cases on admission to the McLean Hospital it is apparent that the use of sedative drugs in the borderline mental cases, as well as in early psychotic states, while quite general, is not conducive to the best therapeutic results. It is true that in a large group of neurotic or early psychotic patients the administration of sedative drugs many times appears to be the logical treatment; but a further study of these cases from the standpoint of the psychiatrist shows that the use of such drugs only adds more toxic material to an organism that is already overburdened with the toxins of an abnormal psychological and physiological activity brought about through worry, fatigue, exhaustion or infection in varying degrees.

In many cases where drugs have been used, a confused or delirious state is precipitated, and the problem of treating the fundamental nervous condition is made increasingly difficult. In many instances their prolonged employment of drugs to combat various symptoms, together with the resulting inability to give them sufficient nourishment and elimination by fluids for a considerable period of time, depletes the physical condition of these patients so that when they finally arrive at the hospital, they are so

*For record and address of author see "This Week's Issue," page 1001.

toxic and physically exhausted that treatment is problematical and in some instances even death has occurred. In a larger number of cases, however, although there is marked physical weakness and delirium, due chiefly to the drugs, the patients are successfully treated and recovery from the drug delirium is brought about, after withdrawal of the drugs, through frequent tube-feedings with enough fluid to establish elimination of the toxins and a sufficient amount of food to nourish the patient. Following this the fundamental psychological condition can be studied and treated.

It is true that there are advocates of the drug treatment of the psychoneuroses and that there are some who include sedative drugs in handling certain psychotic states. The drug system of therapy, as far as sedative drugs is concerned, however, has no rightful place in the practice of psychiatry and has been discredited at this hospital since the late 80's or early 90's. Moreover, while it may be a fact that some neuro-psychiatrists resort to prescribing sedative drugs, I believe that their employment by specialists in this field is rare and of little consequence in comparison with the use made of them by specialists and general practitioners who have recourse to them whenever a patient complains of insomnia or "nervousness". The type of patient who appeals to a physician because of nervousness and insomnia or because of other vague symptoms without much definite pathology must be a real problem to the average busy practitioner who feels that a little veronal, allonal or bromide cannot possibly do any serious harm, especially in view of the fact that both the patient and the family are clamoring for the doctor to "do something".

Many of these abnormal personalities or borderline conditions could to advantage be referred earlier to the mental hospital, where, under proper care and treatment, the acute delirious episodes could often be prevented and the patients established in a proper routine under a system of treatment that would build them up physically and at the same time offer them a proper interpretation of their symptoms and a solution of their problems.

The false opinion formerly entertained that mental diseases were irremedial checked the rational impulse of humanity, and forestalled the recovery of those who were unfortunately afflicted. This erroneous idea in some measure still prevails, or, at least the importance of immediately applying for relief on the first appearance of mental symptoms is not sufficiently understood.

Experience teaches the value of early treatment and frequently patients themselves remark that if they had been sent to the hospital months or even years before, they would have been spared a great deal of suffering and unhappiness and many times the distressing, even terrifying experience of a delirious episode.

It would seem that from the general classification of early psychotic or psychoneurotic cases we can select certain types of patients who, because of the definite nature of their symptoms may be classified under one of the following personality groups. The term "personality" has been used in different senses. Here it will be used to designate the inborn or fundamental psychic capacities, traits and tendencies of the respective individuals.

The types in which the drug deliria most commonly occur and in which the use of sedative drugs should be especially avoided are the following:

Group I. The psychasthenic personality. This term applies to a group of psychopathic and neurotic conditions which includes obsessions, impulsions, phobias, scruples, tics and various anxiety states. These states figure to some extent under the term "constitutional neurasthenia" but differ in that they are not necessarily connected with the truly neurasthenic complex. The background of these disorders is a special type of character; these persons are weak-willed, undecided, hesitating, timid, not combative, not able to take the world as it is, idealistic, longing for love and kindness, and correspondingly with ways that solicit a kindly and just attitude; they are misunderstood and meek, easily led or misled; they need stimulation and are apt to yield without decision, notwithstanding their usually superior intelligence and vivid imagination. This leads to a life given to avoiding troubles, decision and action. The child avoids active plays and is perhaps encouraged by solicitous parents; the choice of occupation is away from the trying struggle. The young man or woman shirks responsibilities, is passive in questions of marriage and choice of work; new situations, a threat, or a job, examinations, new religious duties, or some emotional shock prove too much, and bring forth the symptom complexes.

Group II. The neurasthenic personality, closely allied to the above. This term should be reserved for the cases combining the symptoms of great exhaustibility and irritability, depending largely on the mental attitude, of lack of repose and of ready recoverability, frequent head pressure, palpitation and uneasiness of the heart, gastric disorders and often abnormality of the sexual responsiveness.

Group III. The hypochondriacal personality, frequently associated with other traits of nervousness. In these patients there is a hypochondriasis, usually built on feelings of ill-health which lead to self-observation and explanation. These are apt to be the center of thought and interest, are elaborated, or the patient merely is troubled with vain fears over trifles, consults quack literature, and the various cults. On the whole the impressions of bodily disease are apt to dominate.

These three groups or types are usually included under the term psychoneurosis without

further differentiation. I believe these are the types of personality that are perhaps more vaguely referred to as the neurotic or the neuroses and many of these symptoms give rise to the type of behavior and complaint which is termed nervousness.

Group IV. The constitutional psychopathic inferior, especially the personality type showing emotional instability.

Often the dominant note in the character of psychopaths is the extreme mobility of the emotions. The subject varies alternately from exuberant joy to boundless desolation, from feverish activity to profound discouragement, from affection to hatred, from the most complete egoism to the most exaggerated generosity and devotion.

Group V. The cyclothymic or alternating personality, which perhaps differs from the above only in degree, with more marked periods of depression and exhilaration.

CASE REPORTS

The first case, No. 12,483, is that of a married woman, aged 28, who was characterized by her husband as high-strung and nervous with a tendency to moodiness and excessive worry over trifles. With only the average troubles to worry about, she would become depressed, and it was stated she had suffered from nervousness and insomnia for years. During the year prior to admission to this hospital she had lost twenty pounds in weight and had been unable to take part in golf and other out-door sports she had formerly enjoyed.

The present illness dates back rather definitely two and one-half years, when she began, upon a physician's order, to take allonal for relief of pain in the left maxillary region; at first she took one or two tablets, then gradually increased the frequency and size of the dosage. During the month previous to admission she had taken probably 120 tablets. One evening recently she was known to have taken 10 tablets; lately she has used the drug to induce sleep even when free from pain, and often has taken 8 pellets at a dose. For the past month the patient has appeared rather depressed and restless, gradually becoming hallucinated in the auditory field; she has heard her friends and neighbors talking about her, has heard various imaginary mechanisms like machinery mingled with voices outside her window at night, tried to climb out of the window, trembled and perspired freely. Delusions of a fleeting character, vivid hallucinations and confusion produced a delirious picture on admission.

This patient was placed on a regime of elimination, rest and forced feedings. She cleared up from the delirium in a week and gained 14 pounds in weight in two weeks, when she was discharged as recovered.

This individual probably belonged to Groups I and III, or the psychoneurotic personality. She was always easily upset over trifles, and as a means of escape from her domestic unhappiness and from her upsets at the time of her menstrual periods, she began to take allonal for relief of her fancied pains and insomnia.

Let me cite another case where milder drugs were used at first and later more powerful narcotics. This case, No. 12,272, was a married woman aged 56, who for years had made a poor adjustment to her domestic situation and alternated between periods of exhilaration and depression. Her depressions were quite neurasthenic in character and she had some hypochondriasis with the usual vague pains, apprehensions and insomnia, which were at first relieved by the milder sedative drugs; later and prior to admission she was taking hyoscine, grains 1/200, and morphia, grains 1/2, p.r.n. The result was an acute drug delirium characterized by hallucinations and confusion. This patient cleared up rather slowly but finally made a good recovery, considering the fundamental cyclothymic personality traits which had been poorly treated for so many years.

The following is a case of acute veronal intoxication, Case No. 12,478, a widow age 53. The following brief abstract from the family history will help to establish the personality type of the patient. She was the youngest in a family of seven children. Two sisters were maiden ladies and are described as "very conventional, neurasthenic and melancholy". Two brothers graduated from college and between the ages of twenty and thirty both committed suicide in attacks of depression. For the past fifteen years the patient has averaged an attack of depression every two or three years, each attack lasting about three months. These depressions are characterized by many fears and obsessions with no particular delusions, and throughout her depressions she has always remained mentally clear without marked psycho-motor retardation.

The present illness began in August 1928, following an extensive trip of several months abroad, during which she had trouble with a particular woman with whom she was travelling. This fatigued and worried the patient, who was also distressed to hear that her oldest son was suffering from a mild depression and she feared the son had inherited her type of mental trouble. The patient was admitted to this hospital September 13, 1928, in a state of profound stupor or coma, having taken a quantity of veronal. The nurse knew that the patient had taken the contents of two vials, each containing ten five-grain tablets, or a total of 100 grains. Later the nurse discovered a third vial, from which she had given her two five-grain tablets on the night before, as this had been the customary dosage for the patient on retiring.

While stupors, unconsciousness and deliria are not infrequent in cases on admission to this hospital, such an overwhelming dosage of veronal was unheard of at the time by the writer. The patient was profoundly comatose; her eyes were fixed and the pupils considerably contracted (1/2 mm. in diameter) but reacted promptly to light; the pulse was 64 and fairly good. The reflex responses were as follows: triceps present, but diminished; biceps absent; supinators present; knee jerks, Achilles, plantars and abdominal reflexes absent. The patient swallowed reflexly. These reflexes remained absent until the third day, when the pupils began to dilate and were slightly unequal. The right pupil was 4 mm. in diameter and the left pupil 3 mm., circular and reacted to light. There was some irregularity of the reflexes on this date, but most of them were present except the abdominal and Achilles.

The stomach had been washed out by the local physician, probably not two hours after the drug had been taken, and gastric lavage was resorted to soon after the patient's admission here.

At first the blood pressure was systolic 100, diastolic 62. The respirations were slow, 12. Her color was somewhat cyanotic and the extremities rather cold. A chemical analysis of the blood was made by Dr. Whiteborn two hours after the patient's admission. The non protein nitrogen was 32 milligrams per 100 c.c.; the blood sugar 101 milligrams per 100 c.c. Later in the day two catheter specimens of urine were negative for albumin, sugar and acetone. These specimens, totalling in quantity two liters, yielded 1.3 grams of veronal. The following day further urine examination yielded an additional 0.3 grams of the drug. The latter urine appeared reddish in color. This color came out largely on filter paper and was probably due to haematoporphyrin. This was not confirmed, however, by

spectroscopic tests because a spectroscope was not available.

Treatment consisted of giving a respiratory stimulant at once, caffein-sodio-benzoate hypodermically. The stomach was washed out and tube feedings of glucose solution begun, together with colonic irrigations and enemata of 3 per cent. bicarbonate of soda solution. Protoclysis of normal saline was used to increase the fluid intake, and retention enemata of coffee were given. The patient was wrapped in warm blankets and surrounded with hot water bottles, since the circulation was so poor pulmonary complications were feared. This brought about a profuse perspiration.

Our efforts were directed chiefly to the rapid elimination of the drug through every possible channel. Frequent tube feedings containing large quantities of milk, eggs, and glucose with plenty of water were continued. Catheterization and frequent colonic irrigations were resorted to. Intramuscular injections of pituitrin were given on two occasions in addition to repeated doses of caffein-sodio-benzoate. The patient remained in a stuporous condition for three days; during this time the blood pressure and pulse improved, but at times she appeared somewhat cyanosed and toward the end of the first day her pulse was quite weak. On the second day she developed some temperature, 102¹, and the pulse was 102, the blood pressure 128/72, respirations 26. There were some diffuse bronchial râles throughout the chest and the onset of pneumonia was feared. On the third day the patient became restless, moving the arms and legs, and muttering; later in the day she asked where she was, talked coherently and complained of cramp-like pains in the muscles and of headache. She also had subjective dizziness and diplopia. She began taking fluids by mouth on the fourth day.

The fifth day she sat up in bed and appeared very much depressed and restless. Her temperature was normal, her pulse 76 and respirations 18.

On the sixth day the patient sat up in a chair and on the 7th day she walked a little but was ataxic and complained of some objective dizziness. Following this the patient continued depressed, but recovered completely from the effects of the drug and is making satisfactory progress in recovering from her depression.

In connection with this case much of the clinical literature on acute veronal poisoning was reviewed. According to Leahe and Ware, in a report of 61 cases, they found that 125 grains (8 grams) have occasionally not proved fatal, but usually any dose over 100 grains (6.5 grams) has a very grave prognosis unless the patient is seen early and vigorous treatment instituted. The most characteristic symptoms are stupor, inco-ördination, impaired speech and a general lethargy, which may be very profound. In fatal cases there is deep coma, cyanosis, low blood pressure, cold skin, incontinence of urine and feces, and finally death from respiratory failure. These authors also state that there is seldom any physical basis for the use of the drug, as shown by the fact that there were very few medical or surgical complications in the group. There were, however, a large number of patients who gave evidence of a definite psychopathic state, which ranged from mild melancholia to manic depressive psychosis. The diagnosis of constitutional psychopathic inferiority was made in a number of instances, and the social histories showed a marked frequency of domestic trouble and a general lack of social adaptability. Nineteen of this series took the drug with suicidal intent.

Other writers have said that the study of the personality of the patients intoxicated by barbital has been overlooked, much attention having been given to the somatic changes caused by the drug, and only scant reference being made to the personality types. "The mental makeup of the persons taking barbital is referred to by few observers", says another, who further states, "from my own experience the vast majority of patients suffering from acute veronal intoxication belong to the manic depressive group, while the largest number of the chronic (barbital) patients belong to the emotionally unstable types of the constitutional psychopathic inferior group".

I regard the case of acute veronal intoxication just reported as one of the cyclothymic personality group.

The following case, No. 12,378, a widow age 67, whose father was a chronic alcoholic, was characterized as having the following personality traits:—hypercritical and always confident that her judgment was superior to that of any one else. All her life she had periods of depression alternating with mild hypomanic episodes. She was also self-centered, rather selfish, pleasure seeking. She reacted to the ordinary misfortunes in life by developing depressions. Since 1904 she had used veronal more or less, and to excess for the last 2 years. This excessive use of the drug was brought about by disappointment resulting from her son's marriage. The quantity of veronal taken in this case could not be determined, but a checkup at one drug store where she purchased a part of her supply of the drug showed that between the dates of Oct. 9 and 28 she purchased 60 five-grain tablets of veronal. During the past two years she had lost 70 lbs. in weight. She was admitted to this hospital in an acute confused or delirious state and very much depleted physically from the lack of proper nourishment; a bronchopneumonia developed and the heart action was very weak. In spite of attempts to build up the patient and eliminate the drug, the patient died on the 14th day of her hospital residence.

This case seemed also to belong to the cyclothymic personality group, with a question of constitutional psychopathic inferiority. Many similar cases might be cited.

CONCLUSIONS

(1) The majority of patients using drugs and later developing a delirious or psychotic condition are fundamentally of the cyclothymic, constitutional psychopathic or psychoneurotic personality types.

(2) These personality types should be recognized by physicians and the use of sedative and hypnotic drugs avoided.

(3) Legal restriction of the sale of hypnotic and sedative drugs except on a physician's prescription and the use of the chemical names of the drugs, as for instance, diethyl-barbituric acid instead of veronal or barbital seems advisable.

(4) The early recognition of the bad personality traits and symptoms which constitute one of the several psychopathic states, and the early hospital care and treatment for such cases is recommended.

Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15191

VERTICAL HEADACHE

NEUROLOGICAL DEPARTMENT

First admission. An Irish-American electrician forty-nine years old entered the hospital September 4 complaining of morning headache, chiefly on top of the head.

For three years he had had tinnitus in the right ear. This had been no worse since the onset of the present illness. For the past two months he had had loss of memory for recent events and had talked more slowly than usual. Seven weeks before admission he had a cold in the head, with much discharge from the nose every morning. This had persisted. His eyes ran a good deal. Since the onset of these symptoms there had been much more retardation of speech. Five weeks before admission he began to have a severe vertical headache every morning, usually disappearing after breakfast and recurring toward evening. For three weeks he had had daily morning nausea followed by vomiting, not projectile, and had a cough with thick white sputum and hoarseness. He rarely had night sweats. For two weeks he had had blurring of vision and vertigo. At times he felt as if he would fall.

His father died at thirty-five of phthisis. One daughter died at five with a questionable diagnosis of weakness of the heart.

His eyes had always troubled him, aching at times. He had worn glasses since he was twenty-one. He had had no diplopia. The left nostril was smaller than the right. He had gonorrhea with treatment before he was married. He had typhoid fever fifteen years before admission. He had tonsillitis ten years before admission. Four months before admission he had four teeth extracted.

Clinical examination showed a well nourished man with skin lesions on which a diagnosis of psoriasis was made. The heart, lungs and abdomen showed no abnormalities. With the arms extended there was slight tremor of the hands, more on the left. Knee-jerks and ankle-jerks very lively but equal. Bilateral Babinski was found at the entrance examination, but was not found by the visiting neurologist a week later.

Neurological examination. Face pulled to the right on showing teeth. No tremor of the tongue. Grips equal. Vibratory sense in the right leg diminished from the knee down, in the left leg diminished in the ankle. Reflexes normal except for Babinski.

Urine normal except for a slight trace of sugar. Blood: 16,600 to 15,425 leukocytes, polymorphonuclears 78 per cent, hemoglobin 80 per cent.

Chart normal.

Consultations. Oculist: a few floating vitreous opacities. The right disc showed hyperemia, near obliteration of physiological cup with one-half to one diopter of elevation. The left eye showed hyperemia with blurring of the nasal margin. Extra-ocular movements normal. At a second examination two days later the same findings were reported. There was also fine jerking rotary nystagmus on looking up and to each side. Visual acuity was normal. A third examination a week later showed no change. Ear consultant: No deafness. Both drums were retracted and the ossicles were not too freely movable in the right side. This probably accounted for the tinnitus. A caloric test with cold water showed no abnormalities of the horizontal canals, but the nystagmus, vertigo and past-pointing from the vertical canals of both ears, although in the right direction, was very poor.

X-ray of the skull showed no abnormalities of the skull or sinuses. The roots of four teeth showed abscesses. These teeth were extracted by a dentist and two more were reported as dead.

September 9 the patient felt as though he wanted to vomit although he was not really nauseated. He became dizzy, weak, semiconscious and would have fallen to the left if he had not been caught.

September 14 a lumbar puncture between the fourth and fifth lumbar vertebrae gave clear fluid, initial pressure normal, good rise and fall on jugular compression, 1 cell, alcohol positive, ammonium sulphate and Wassermann negative, total protein 97 milligrams, colloidal gold 1111211000.

While the patient was in the hospital the nausea and vomiting stopped and the headache became less frequent and severe. September 21 he was discharged, to return at the end of a month for check up.

History of interval. After going home the patient had a return of the attacks, though they were less severe. On October 9 he was semicomatose. The following day he could remember seeing two physicians and several ministers, but could not remember any events connected with them.

Second admission, October 10, three weeks after his discharge.

General physical examination was as before. Neurological examination the day after admission showed definite bilateral plantar flexion. There was very little evidence of lack of co-

ördination in the finger-to-finger and finger-to-nose tests. Nystagmus was very slight if present at all. There was no ataxia. There was questionable slight left fifth motor and left seventh weakness. Tinnitus was present on the right.

Before operation the chart was normal.

October 13 operation was done. After it the temperature was irregular, with periods of elevation to 100° or 101°, once to 102.2°, lasting one to three days, with intervals of days or weeks of normal or occasionally subnormal temperature. The pulse was 56 to 130; usually below 90 until November 18. The respirations were not remarkable until December 13, when there was a terminal rise in the whole chart—temperature 100° to 105.2°, pulse 108 to 150, respirations 22 to 50.

X-ray examination October 16 showed a peculiar mottled appearance of the bones of the skull. The calvarium was rather heavy. A review of the previous plates showed similar but less marked changes. The sella turcica appeared normal. There was calcification in the region of the pineal gland. There was no evidence of increased intracranial pressure.

October 21 there was mild staphylococcus infection of the wound, causing edema so marked as to shut the right eye. Four days later the entire extent of the incision was infected. There was evidence of pressure. October 27 herniation of the brain tissue was suspected and October 31 was definitely present. The infection slowly cleared. A consulting oculist found early choking of each disc. The physiologic cups were still present. November 6 a lumbar puncture showed an initial pressure of 450, total protein 65. 40 cubic centimeters of clear fluid was withdrawn. After the procedure the swelling was definitely diminished and the skin edges were partially drawn together with adhesive. Lumbar punctures were done also on October 19, 20, and 27. The patient lost ground steadily, became much more stuporous, with Cheyne-Stokes respiration at times. An attempt to tape the skin edges over the wound caused blockage of pus drainage and spread, so that the wound was left wide open. The brain fungus was moderately riddled with small abscesses. By December 11 the infection had practically cleared and epithelialization was almost complete. The wound was not particularly tense. The fundi seemed quite flat, with evident secondary optic atrophy. The patient was periodically drowsy and alert. December 16 the leukocyte count was 72,800, the polymorphonuclears 93 per cent. There were signs of possible beginning pneumonia. December 17 these were increasing. That night the patient died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

That past history does not help us. The present illness also is not distinctive, but makes me think of chronic nephritis more than of any other disease because of the headache and blurred vision. The catarrhal symptoms are presumably due to something else occurring as a complication.

NOTES ON THE PHYSICAL EXAMINATION

As far as I know people do not die of psoriasis, so I think we can put that to one side.

What diagnosis did they make at the end of the first admission? Some things suggest cerebral tumor. Some things suggest arteriosclerosis of the cerebral vessels, which so far as I know could give him all the nystagmus and ear changes that he had. I should suppose one of those two diagnoses was made, probably the first. May we have the diagnosis that was made when he went out of the hospital the first time?

Miss Painter: It was toxic papilledema; brain tumor suspected.

Dr. Cabot: Exactly what they mean in that interval history I do not know.

We all have plantar flexion on stimulation. Whether he means continued spasm in that direction I am not sure.

I take it the operation was done with a diagnosis of brain tumor.

PRE-OPERATIVE DIAGNOSIS

Probable brain tumor.

OPERATION

Under ether anesthesia the usual type of right subtemporal decompression was done. The dura and brain were under considerable increase of pressure. The convolutions were flattened and pulsation was diminished. No local evidence of tumor by inspection or palpation was discovered. Punch specimens which were taken were negative in gross appearance.

There is no pathologic report.

Further Discussion

So we have confirmation of intracranial pressure such as a tumor would give, and more, probably, than a vascular lesion would give. I should say we are still where we were before. It is probably brain tumor, site unknown.

Dr. Holmes, will you demonstrate the X-ray films to us?

Dr. George W. Holmes: It is really difficult for you to see these plates at such a distance and in this light, but there is a very fine mottling in the bones which is not characteristic of any particular lesion. In this note it says there is no evidence of increased intracranial pressure; but of course we know that he did have it, at least there was evidence of it in X-ray seen later. It must have been going on for some time before we saw evidence of it at X-ray.

Dr. Cabot: Absence of evidence does not prove that it was not there.

Dr. Holmes: No; negative evidence is of no

value. Positive evidence may be. The note speaks of some irregularity and increased density back of the sella turcica. That is not characteristic enough for me to draw any conclusion. It may be an abnormal finding. Some of these brain tumors show calcification in the tumors themselves. But we have nothing here to justify us in making a definite diagnosis. That mottled appearance of the skull may be just atrophy. I do not know why he should have it. One of the things that should be considered is metastatic malignancy. We have no other evidence of it. It is unusual to have it metastasize to the skull and nowhere else. My interpretation would have to be some unexplained phenomenon that has nothing to do with the present illness.

DR. CABOT: Was he fluoroscoped?

DR. HOLMES: There is no record of it.

DR. CABOT: Suppose he had cancer of the prostate, would the appearance here have any connection with that?

DR. HOLMES: Yes, that is possible; but metastases from cancer of the prostate are apt to be larger and are more dense. The destroyed areas are more bright.

DR. CABOT: The lumbar puncture was done not for diagnosis but to relieve pressure.

DIFFERENTIAL DIAGNOSIS

I do not know what else to say except cerebral tumor, possibly with pneumonia at the end.

A STUDENT: Would you consider brain abscess?

DR. CABOT: Yes, we always ought to consider brain abscess when we consider brain tumor. They give very much the same symptoms. But the fact that he went so long without temperature is somewhat against abscess.

A STUDENT: He had sinus trouble, too.

DR. CABOT: That is a very queer place for sinus pain. I thought of that, but I never heard of it up there.

A STUDENT: He had several abscessed teeth.

DR. CABOT: They are unimportant when you consider the fact that most respectable citizens have them too. I cannot take those teeth seriously. Some people would.

A STUDENT: He had a retracted ear drum on one side.

DR. CABOT: That is chronic rather than suppurative or acute.

A STUDENT: How long did the pulse stay down as low as 56?

DR. CABOT: That would be evidence of intracranial pressure, if that will help the diagnosis. It could not be evidence of anything else that I can see.

MISS PAINTER: The pulse was 56 for only a few hours on three different days.

A STUDENT: He had a leukocytosis in the beginning. Wouldn't that go well with brain abscess?

DR. CABOT: That is a good point. I should have thought of that. I cannot remember leukocytosis with brain tumor. It may occur, but I do not remember it.

A STUDENT: Could that fine mottling of the skull be due to osteomyelitis?

DR. HOLMES: Yes, that would be quite possible. Osteomyelitis might look like that. But this is too general. Osteomyelitis is usually localized, not scattered through the skull.

DR. CABOT: I think I am influenced more or less by the fact that during the operation they made no attempt to find brain abscess. Perhaps they ought to have attempted it. But I am rather prejudiced in favor of their reasoning as we do. So far as that description of the operation goes it looks as if they are looking for a tumor. There was no probing or no trocar used as they do in many cases of brain abscess. I cannot answer this question about the high leukocyte count. It certainly sounds like something more than tumor. Of course at the end we could have a leukocytosis from infection. There is plenty of evidence of infection there, but the initial high leukocyte count I cannot explain.

A STUDENT: Would the abscessed teeth give leukocytosis?

DR. CABOT: In so far as I have heard, no. Otherwise nearly everybody would have a leukocytosis.

A STUDENT: What was the postoperative infection that he had, with the temperature going up and down?

DR. CABOT: I suppose that is the infection in the wound itself. I suppose the temperature and leukocytosis were connected with that and in the end he had pneumonia too.

I should say that as far as we have gone the evidence is in favor of tumor except the blood, which is against it on the basis of any knowledge that I have. But on the whole it seems to me more like tumor than it does like abscess.

A STUDENT: Could the mottling in the skull go with tuberculosis?

DR. HOLMES: No. I have never seen tuberculosis involve the skull.

A STUDENT: What do you make out of the spinal fluid? Does it go with brain tumor?

DR. CABOT: Yes, I think so.

Ought we to think of anything else beside tumor or abscess? I cannot think of anything else.

A STUDENT: Is primary carcinoma of the lung ruled out here? It seems to me that he had several lesions inside the brain. Perhaps that is due to cancer of the lung metastasizing in the brain.

DR. CABOT: Carcinoma of the lung. We have not a bit of positive evidence of that. If we can have carcinoma of the lung without evidence, then this could be metastatic to the brain. I do not see how we can go beyond speculation on that.

A STUDENT: It is long standing in the skull.

DR. CABOT: Yes. On the whole I am a bit against carcinoma, but not on very good evidence.

As a general thing will brain abscess show by X-ray?

DR. HOLMES: No.

DR. CABOT: Or tumor either?

DR. HOLMES: Tumor will show in a certain percentage of cases.

A STUDENT: Will you localize the lesion?

DR. CABOT: No, I should not like to. It is either abscess or tumor. I cannot localize it.

A STUDENT: It is said the speech was slow. Is that the result of paralysis, or is it characteristic?

DR. CABOT: I do not know whether there was anything characteristic about that.

A STUDENT: Are there cells in the spinal fluid with brain abscess?

DR. CABOT: It depends on communication. Certainly there can be brain abscess that does not communicate with the cord.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Brain tumor, suspected with left hemiplegia.

DR. RICHARD C. CABOT'S DIAGNOSIS

Brain tumor.
Terminal pneumonia.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Metastatic papillary adenocarcinoma (probably primary in kidney) in brain, lung, liver, adrenal, kidney.

2. *Secondary or terminal lesions.*

Septic infarction of the lung.
Empyema.
Operation wound—right subtemporal decompression.
Herniation of the brain.
Trephine.

DR. TRACY B. MALLORY: This man had several tumors in his brain, but they were papillary adenocarcinomas. Tumors were also found in the skull, in the lungs, in the bronchial glands, in the adrenals, and in one kidney. The lesion in the kidney was almost the smallest of all of these. On the other hand the kidney is the only one of all these regions where a papillary type of growth is at all common. I believe that the kidney tumor, which was not more than half a centimeter in diameter, was the primary growth from which all these metastases occurred. The terminal event proved to be not a pneumonia but a septic infarct of the left lower lobe which perforated through the pleura and caused a beginning empyema.

A STUDENT: Where were the metastases in the brain? Were they at the base of the skull?

DR. MALLORY: A firm round area two centimeters in diameter was felt on external examination in the parietal region in the right cerebral hemisphere. There was a separate nodule in the posterior part of the left frontal lobe, a small one 4 millimeters in diameter on the surface of the left temporal lobe and a tumor in the right uncinate gyrus.

A STUDENT: Were tumors found in both adrenal glands?

DR. MALLORY: In one.

DR. HOLMES: Were the metastases in the skull of the type that would produce such an X-ray picture? Could the fine mottling seen in the films be due to very fine generalized metastases?

DR. MALLORY: The tumors noted in gross were all rather large ones which projected somewhat inside and had lifted the periosteum from the inner table, and we found no diffuse infiltration microscopically.

DR. CABOT: I think that we shall have to believe in the future that we can have leukocytosis in brain tumor.

A STUDENT: He had an upper respiratory infection in the beginning.

DR. CABOT: He had a cold. That does not ordinarily cause a leukocytosis.

That diagnosis of lung cancer was a very good diagnosis. I never should have made it.

CASE 15192

A CASE OF IMPLANTATION OF URETERS INTO THE SIGMOID FOR EXTENSIVE RECTOVAGINAL AND VESICOVAGINAL FISTULAE

SURGICAL DEPARTMENT

A married Albanian woman twenty-five years old entered September 21 complaining of incontinence of urine and feces.

Four years before admission she was badly torn during a very hard delivery, labor lasting three days. The tears were not repaired. Since that time she had been incontinent of urine and feces. Her family history is not significant. The pregnancy four years ago was her only one in twelve years of marriage. The child was born dead. For two years after that delivery she did not menstruate. Recently her periods had been irregular, occasionally coming at intervals of less than three weeks.

Clinical examination. The apex impulse of the heart was not found. The aortic second sound was accentuated. The abdomen showed slight tenderness in both lower quadrants. The perineum was badly torn, but the rectal sphincter was intact. About an inch within the vagina there was a large opening into the rectum the size of a silver dollar. The anterior wall of the vagina was practically entirely missing. There was no urinary meatus, urethra, or internal sphincter. The examining finger passed directly into the bladder. The cervix was small and fixed in posi-

tion by scar tissue suspended between the vesical and rectal fistulae. The fundus of the uterus was small and movable. The knee jerks and abdominal reflexes were extremely hyperactive, the biceps and ankle jerks normal. There was definite but not sustained patellar clonus. The examination was otherwise negative.

Before operation the urine showed a trace of albumin at one of two examinations; no other abnormalities. The chart was normal.

FIRST OPERATION, OCTOBER 10

REPAIR OF RECTOVAGINAL FISTULA

Examination under ether anesthesia disclosed a defect of the entire anterior vaginal wall resulting in an opening into the bladder the size of a silver dollar. The edges of this were hard and rigid. The urethra was completely absent, likewise the sphincter of the bladder. It was found to be impossible to catheterize the ureters, as they could not be brought into view. On the posterior vaginal wall there was an opening into the rectum admitting two fingers. There was a narrow strip of vagina on each lateral wall. The sphincter of the rectum, however, was intact. The mucous membrane bordering the recto-vaginal fistula was incised and the vaginal wall separated from the rectal wall. Two incisions were made through the lateral walls of the vagina into the perineum on each side of the rectum and anus. The rectum was freed up well into the ischiorectal fossa and above the vaginal vault on both sides. There was moderate bleeding, controlled by gauze packing. The peritoneal cavity was opened in one place and immediately sutured. After freeing the rectum on both sides the defect was closed longitudinally by continuous catgut stitches. This was reinforced by another layer of Lembert sutures and finally the lateral walls of the vagina were brought together over the rectal sutures. A catheter was then inserted through the fistula into the bladder and the fistula partly closed by suturing the cervix to the vulva.

FURTHER HISTORY

The patient made a good recovery from ether. Constant irrigation was employed through the inlying catheter and the vagina was douched frequently. Later it was found necessary to use suction in the vagina to remove the accumulated fluid. The lower portion of the rectal repair held, but the uper portion gave way, forming a fistula that would admit a lead pencil.

On October 29 the temperature shot up to 102° and the patient was chilly and complained of pain low in the back. The pain and high temperature persisted for the next four weeks. There was bilateral costovertebral tenderness. November 13 there were painful ulcerations under the tongue, disappearing under treatment in ten days.

SECOND OPERATION, DECEMBER 15

TRANSPLANTATION OF URETERS INTO SIGMOID

REPAIR OF SMALL RECTOVAGINAL FISTULA

Gas-ether. A paramedian incision was made. Both ureters were isolated and transplanted into the sigmoid, following the complete Coffey technic, that is, irrigation of the rectum, packing with gauze, mobilization of ureters, insertion of catheters, submucous transplantation of ureters into bowel. Peritoneal flaps were brought over the ureters at their insertion. Cigarette wick to pelvis. On the right side a number 14 ureteral catheter was used, on the left side a number 14 soft rubber Levin tube.

The rectovaginal fistula was then repaired by refreshing margins and separate suture of rectal and vaginal walls.

FURTHER HISTORY

The recovery from this operation was uneventful. The catheters discharged from 35 to 40 ounces of urine daily. The catheters were removed on the fifteenth day. The rectovaginal fistula repair, which had shown some sepsis at first, had healed by granulation. By the time the catheters were removed there was no leakage of urine or feces.

At the time of discharge, on January 17, she could retain 8 ounces of urine in the rectum. She could retain urine for eight hours during the night. During the day she evacuated the rectum every two or three hours. Control was complete. Proctoscopic examination failed to show the uretic orifices in the bowel wall.

DISCUSSION

BY LINCOLN DAVIS, M.D.

This case presented a difficult problem. Here was a young woman with nearly the entire vaginal wall missing, as well as the urethra and vesical sphincter. There was also a very large rectovaginal fistula and much scar tissue. It did not seem technically possible to repair the vesico-vaginal fistula and obtain urinary control on account of the absence of urethra and internal sphincter; furthermore a plastic operation of such extent seemed impossible without sacrifice of the vagina. Complete closure of the vulva with the formation of a cloaca, as was done successfully by Dr. W. W. Keen many years ago, was not desirable in the case of a young married woman for obvious reasons.

Transplantation of the ureters into the sigmoid, which has become a successful surgical procedure owing to the technic originated by Dr. R. C. Coffey, seemed the logical method of dealing with the urinary incontinence.

Repair of the rectovaginal fistula was undertaken as a necessary preliminary. This operation was performed on October 10, at the time of the meeting of the American College of Surgeons in

Boston. The presence of the large vesical fistula was a complicating factor on account of urinary leakage which made healing somewhat precarious. The ureteral openings in the bladder could not be seen to allow of catheterization. A catheter was therefore fastened in the bladder and constant irrigation and suction employed to keep the field as nearly sterile as possible. In spite of these precautions the upper portion of the wound broke down and resulted in a rectovaginal fistula of about one-quarter of the original size.

After a stormy period of convalescence of two months, complicated by severe bilateral pyelitis, the patient was finally considered ready for ureteral transplantation. This was done on December 15. At the same time the small rectovaginal fistula was repaired.

The immediate result was very satisfactory. It remains to be seen whether or not pyelonephritis develops in the future. In view of the definite attack of bilateral pyelitis preceding the ureteral transplantation the outlook is none too good.

At the present time the vagina is somewhat contracted by scar tissue, and the examining finger readily enters the bladder. Whether the latter will prove to make a satisfactory substitute for the vagina remains to be seen.

DIAGNOSIS

Rectovaginal and vesicovaginal fistulae.

FREQUENCY OF DISABLING SICKNESS AMONG INDUSTRIAL EMPLOYEES

For some time past the Public Health Service has been conducting studies on the frequency of disabling illness among industrial employees. In connection with such studies the experiences from a group of 35 industrial sick-benefit associations and company relief departments have been carefully analyzed.

The following results of these studies are of considerable interest:

Although statistics of sickness frequency based upon the claims for sickness benefits of members of industrial mutual associations do not for various reasons actually measure the incidence of disability which lasts more than one week, they do afford some knowledge of the sickness experience of a sample of the industrial population.

Respiratory diseases were reported as the cause of 41.8 per cent. of the claims for illness benefits; digestive diseases 13.7 per cent.; and external causes (non-industrial accidents), 10 per cent. These three groups, accordingly, accounted for virtually two-thirds of the cases for which sick benefits were paid by associations reporting to the United States Public Health Service.

In the respiratory group influenza and grippe were of outstanding importance, accounting for nearly one-half of all the respiratory cases recorded during the seven years ending December 31, 1927.

In the digestive group disease of the stomach (not including cancer), appendicitis, diarrhea and enteritis, and hernia were the most important numerically, in the order named, 1921-1927.

Next to the digestive diseases the circulatory-urinary group showed the largest number of cases, followed by rheumatism (acute and chronic). Diseases of the nervous system, diseases of the skin, diseases of the organs of locomotion, and the epidemic and endemic diseases constituted the remaining groups of importance numerically.

The incidence rates by years, 1921-1927, showed an upward trend both for the respiratory and the non-respiratory groups of diseases. Each year since 1922 the frequency of external causes (non-industrial accidents) has been larger than in the preceding year. Influenza and grippe principally accounted for the upward trend in the respiratory incidence rates. Among the non-respiratory diseases digestive diseases and the circulatory-urinary group showed the most perceptible increases.

The frequency of cases according to their duration in weeks was ascertained for 1922-1924 and for 1925-1927 in the 15 associations which reported continuously throughout both periods. In 1925-1927 there was a lower rate of cases lasting 8 to 20 days than during the preceding three years, but a higher rate of cases lasting 8 weeks or longer.

The frequency of 8-day or longer disabilities was 50 per cent. higher among female than among male industrial employees, 1921-1927, although the comparison excluded nearly all diseases which were not common to both sexes.

A low sickness rate was found among employees of the iron and steel industry. The rates were especially low for neurasthenia, the digestive diseases, bronchitis, influenza, and grippe among steel workers. The incidence rate of pneumonia, however, was found to be considerably higher in steel than in the other industries represented, and a special study is in progress to determine the causes of predisposition to pneumonia in this industry.

The seasonal peaks of sickness incidence were determined largely by the frequency of respiratory diseases, and especially by influenza and grippe. The non-respiratory diseases as a group also showed a tendency toward greater prevalence in winter and early spring than in the summer and autumn months.—*United States Public Health Service.*

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 126 Massachusetts Avenue.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 126 Massachusetts Avenue, Boston, Mass.

ADVERTISING

OUR country has been passing through a wave of hysteria—Prohibition. Now we are engulfed in a furor of advertising. How soon we shall have to display the name of the maker of our hats on the outside rather than on the inside of our headgear remains to be seen. We have to plough through fifty pages of advertisements in our morning papers to find the news, which is printed in space which cannot be sold to advertisers; in every issue our magazines have some two hundred pages of highly colored pictures and black and white illustrations of every known article of trade from roller bearings to the latest models of water closet seats. Recently the serious article of an ex-president of the United States was displayed on two front pages of a magazine and then the article continued in the valleys of subsequent pages, on one faced by a large picture of a lady brushing her teeth with the very best toothpaste. Dignity and propriety have gone. Even the air is becoming cluttered by the voice of the advertiser. The merits of woven hose are sung to us as an alliterative duet and an ever increasing number of manufacturers employs poor bands and announcers to praise their commodities. The magazines and newspapers vie with each other in printing what they consider to be the steps of progress in medicine thereby too often putting real science in a false light.

The question arises what is to be the effect of this publicity on the medical profession. No light, apparently, is to be hidden under a bushel and why should not the doctor let his light shine? There it is. But does the doctor wish the general public, which he serves, to know what he can do? No. He does not, because even if an individual physician feels that he has discovered some specially effective method of treating the sick, he should not tell it to the public until it has been tested and found to be sound by his fellows in the profession. All he wishes to do is to let his investigations be known to those who are striving in the same field. The public, with no medical training, are not competent to judge the merits of advances in the science of medicine, any more than they can judge of the worth of the Einstein theory. The conception that because everyone possesses a body he knows how it is constructed and functions has long gone into the discard. Do we understand all the parts of the radio or even the automobile? It behooves the medical profession to be conservative, to carry on with their work and wait for the advertising mania to calm down. There are many things in this world, more particularly in the learned professions, that are not fit subjects for advertising.

APPOINTMENT OF DR. A. WARREN STEARNS

THE appointment of Dr. Stearns by Governor Allen to the important post of Commissioner of Correction for Massachusetts is to be commended from every viewpoint. Dr. Stearns, long recognized as one of our leading psychiatrists, has for many years been interested in the problem of crime and the criminal. His attitude toward this knotty question has been devoid of sentiment and prejudice. He cannot in the remotest degree be charged with the much criticized tendency of seeing in all lawbreakers evidence of mental aberration, but rather, as he has repeatedly stated, regards crime largely as a social problem.

The chief significance of such an appointment is that Governor Allen has recognized the intimate relationship between medicine and this most important social question, and has taken the hitherto unprecedented step of placing in control a man trained as a psychiatrist and wholly without political affiliations. It is clear that the study of human behavior, or psychiatry, in its present-day broad conception, is the main connecting link between medicine and public affairs. That such recognition has been so slow in coming should not detract from our satisfac-

tion that it has finally come, and should make us hopeful that medicine, as a "shut in" profession will cease to exist. Dr. Stearns's appointment is but one of the many evidences that a better day has dawned and that, in the already trite phraseology, the person as well as his disease, is worthy of study. The newer point of view is gradually but surely permeating the proverbial conservatism of doctors everywhere, and there can be no doubt that their usefulness will be immeasurably increased thereby.

It is significant in this connection that an Institute of Criminal Law has just been established at the Harvard Law School. As stated in the *Alumni Bulletin*:—"The object of the Institute is the enlargement of the approach to the problem of crime, from a mere study of the law in books, to a study of what can be done in a practical way to affect the conduct of human beings who menace social interests. . . . The experience of society has shown that mere punishment of the prisoner does not yield adequate results in reducing crime. The problem is one in human conduct. Psychiatrists, social workers, and physicians must be called into consultation and the efforts of different experts co-ördinated."

It is, therefore, with peculiar satisfaction that we note the appointment of Dr. Stearns as a most significant step in progress toward a closer relation of medicine and civic affairs and a corresponding development of a broadly intelligent approach to the study of crime, primarily a social problem with intimate psychiatric implications.

THE COMPLACENCE OF THE ANTIVACCINATIONIST

MASSACHUSETTS is in a fair way to sympathize with Ohio in the smallpox problem. With two outbreaks thus far this year, the Commonwealth may find the public health situation increasingly unpleasant. Ohio has averaged 3975 reported cases of smallpox each year for the past seventeen years and up to March 29, 1929, has had 524 cases or a daily average of six. The *Ohio State Medical Journal* records the opinion of the Ohio State Department of Health that this disgraceful condition can be laid in great measure to the influence of the antis and cultists.

Here, as in Ohio, physicians have labored unceasingly to save the people from this dangerous and exceedingly unpleasant disease.

We often wonder as to the state of mind of the antis. Do their victories in demolishing some public health strongholds bring pleasure to their souls when they read of the suffering of victims of smallpox? The bitter antagonism to the medical profession may, we fear, destroy some of the natural sympathy for sufferers inherent in normal human beings.

Even in the presence of the epidemic now in this state we have had reported to us disbelief in the efficacy of vaccination and the suggestion that the vaccination propaganda is carried on as a revenue producing scheme for doctors.

The experience of years in attendance at legislative hearings seems to demonstrate that the opponents of health measures are definite but unwitting allies of the death producing organisms of disease. We try to believe that they know not what they do although in the doing they bring disaster to many persons.

Human nature and resentment have many times led physicians under discouragement in the evidence of opposition by the antis to make the suggestion to permit the antis to have their way and thereby create more evidence of folly in larger outbreaks of smallpox with the expectation that disaster would be more potent than sane argument in developing protective measures.

This is, however, unfair to those whose minds are open and will be governed by scientific advice.

The medical profession must continue to wage a relentless war with disease and especially with the ignorant promoters thereof.

We are enlisted under Dr. S. B. Woodward's banner and will march to victory before long; probably next year when the requirement for vaccination of pupils in private schools will be added to the present law.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

PEIRSON, EDWARD L., JR. S.B., M.D. Harvard 1925. Surgical House Officer, Massachusetts General Hospital, 1926-1927. Resident Urological Service, Massachusetts General Hospital, 1928. At present, Visiting Physician to the Out-Patient Department, Salem Hospital and Assistant Urological Consultant to the Tumor Clinic, Massachusetts General Hospital. His subject is: "The Emptying Time of the Kidney Pelvis." Page 959. Address: 33 Summer Street, Salem, Mass.

HOMANS, JOHN. B.A., M.D. Harvard 1903. F.A.C.S. Surgeon, Peter Bent Brigham Hospital. Assistant Professor of Surgery, Harvard Medical School. His subject is: "The Operative Treatment of Varicose Veins, Varicose Ulcers and Phlebitis." Page 965. Address: 721 Huntington Avenue, Boston, Mass.

O'NEIL, E. EVERETT. A.B., M.D. Harvard 1920. F.A.C.S. Junior Visiting Surgeon, Boston City Hospital. His subject is: "The Injection Treatment of Varicose Veins." Page 972. Address: 270 Commonwealth Avenue, Boston.

MACOMBER, DONALD. A.B., M.D. Harvard 1909. F.A.C.S. Research Fellow in Obstetrics, Harvard Medical School. Address: 321 Dartmouth Street, Boston. Associated with him is:

SANDERS, MORRIS B. A.B., M.D. Harvard 1919. Assistant Urologist, Massachusetts General Hospital. Address: 321 Dartmouth Street, Boston. Their subject is: "The Spermatozoa Count. Its Value in the Diagnosis, Prognosis and Treatment of Sterility." Page 981.

SOWLES, HORACE K. A.B., M.D. Harvard 1915. F.A.C.S. Out-Patient Surgeon, Massachusetts General Hospital. Assistant Surgeon, Beth Israel and Faulkner Hospitals. Consulting Surgeon, Lawrence Memorial Hospital. Assistant in Surgery, Harvard Medical School. Instructor in Surgery, Tufts Medical School. His subject is: "A Review of Three Hundred Consecutive Surgical Cases with Special Reference to Post-Operative Pulmonary Complications." Page 984. Address: 279 Clarendon Street, Boston.

O'CONNOR, DENIS S. M.D. Bowdoin Medical School 1919. Post-graduate in Orthopedic Surgery, Harvard Medical School, 1924-1926. Instructor in Orthopedic Surgery, Yale University School of Medicine. Associate Surgeon, New Haven Hospital and New Haven Dispensary. Consulting Orthopedist, Waterbury Hospital, Waterbury, Conn. Formerly Attending Orthopedic Surgeon to Waterbury Hospital, Chase Dispensary and St. Mary's Hospital, Waterbury, Conn. His subject is: "Traumatic Subastragalar Arthropathy." Page 987. Address: 330 Cedar Street, New Haven, Conn.

TILLOTSON, KENNETH J. M.D. University of Vermont College of Medicine, 1921. First Assistant Physician McLean Hospital, Waverley, Massachusetts. His subject is: "The Abuse of Drugs in Certain Psychopathic States With Reports of a Few Cases." Page 990. Address: McLean Hospital, Waverley, Mass.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY

Frederick L. Good, M.D., *Chairman* **Louis E. Phaneuf, M.D.,** *Secretary*
Frederick J. Lynch, M.D., *Clerk*

What Is the Treatment of Impetigo Contagiosa?

During the past few years many papers have been written on the treatment of impetigo contagiosa (pyodermia, pemphigus neonatorum). Many old and new therapeutic agents have been tried out with more or less good, or bad results. Mercurochrome 220-soluble, gentian violet, iodine, silver nitrate, chlorinated soda, sun baths, ultra-violet and quartz light treatment, each and every one of these has found a strong supporter who has shown statistically that his own particular agent was the most efficient in combating this dreaded nursery's scourge.

However, at least in the greater maternity centers in this vicinity, there has been a reversion to the old reliable ammoniated mercury.

Ammoniated mercury, besides its unquestionable efficacy in the greater majority of cases of impetigo, has the advantage of being available everywhere, it is inexpensive, it is easy to apply, it is clean and it may be used with as excellent results to prevent the spreading of the diseases in nurseries.

Recently Chadwell has published in this JOURNAL a paper on the control and treatment of impetigo neonatorum and his technique has found strong supporters in many lying-in hospitals. The following is taken verbatim from his article:—

"*Prophylaxis.* As soon as the delivery room care of the eyes is carried out, the infant is sent to the floor nursery. Here it receives its only washing with soap and water during its sojourn in the institution. Following the removal of vernix and blood by this washing, the baby is 'larded' with ungentum hydrargyri ammoniati 5% from crown to sole. The orders are to rub in, not on. All subsequent care of the skin consists of a daily thorough inunction with sterile cottonseed oil. In theory, this practice aids still further toward impregnating the skin pores with the mercurial ointment. When diapers are changed, the invariable rule is to wipe off the parts with absorbent cotton and sterile oil, without the use of water. In so large an institution, the advantages of this omission of water bathing are numerous, but such discussion scarcely belongs in this article.

"*Isolation.* The smallest skin lesion is reported immediately to the resident or visiting pediatrician by the nurse, but this report is generally not made until the baby has been routinely put 'on precautions.' We have a small, so-called isolation room, for each nursery, and of course depend on frocking and the prevention of finger contacts. Every case of pyodermia, however simple, is regarded as a potential case of impetigo, and is subjected to the following routine, private case or house patient.

"*Treatment.* Any or each suspicious lesion is evacuated and the area thoroughly anointed with 5% ammoniated mercury ointment twice daily. Practically speaking, this is the end of the episode. If no new lesions appear in three days, the infant is returned to the nursery. Should there be several lesions on an infant, typical in character, not only is the above technique carried out, but in addition the entire skin surface of the infant is thoroughly rubbed daily with a 3% ammoniated mercury ointment, sterile oil application for a few days. Such a procedure occurs only, however, when we, so to speak, 'lean over backward' and when the obstetrical visitant looks particularly grave and con-

cerned for the cleanness of his service. In our private nursery where every visitant is apprehensive because he knows of some similar institution with closed doors, a concession is frequently made in this direction of safety."

It should be added that ultra-violet rays and the quartz lamp may be efficacious in drying up persistent impetigenous or extensive pemphigus lesions which will not yield to ammoniated mercury. At times blood transfusion has cleared up some stubborn cases.

If these methods fail, 5% silver nitrate, 3% tincture of iodine, 2% gentian violet or 1% mercurochrome should be tried.

Questions of a similar nature to the above will be discussed in the JOURNAL each week until June. They may be addressed to the Clerk of the Committee, in care of the JOURNAL and will be answered by members of the Committee of the Section of Obstetrics and Gynecology.

MISCELLANY

A TRIP TO THE AMERICAN MEDICAL ASSOCIATION MEETING

After conference with the delegates from New England the following trip to the meeting of the American Medical Association in Portland is suggested to the members of the Medical Societies of the New England States.

Special cars will be provided. If enough desire to join, a special train will be provided.

Those at the headquarters of the Massachusetts Medical Society will aid in any way they can those who wish to attend the meeting.

An early response is urged.

NEW ENGLAND ITINERARY TO MEETING OF AMERICAN MEDICAL ASSOCIATION, PORTLAND, OREGON—JULY 8-12, 1929

July 4, Thursday.
Lv Boston 3:15 P. M. (E. S. T.) via Boston & Albany R. R. "Wolverine" at South Station.
Special sleeping cars will be provided.
Lv Worcester 4:25 P. M.
Lv Springfield 5:45 P. M.
Lv Pittsfield 7:30 P. M.
Lv Albany 8:55 P. M.
Members may join train at Boston or at one of above points.

July 5, Friday.
Enroute through Michigan, passing Detroit, Battle Creek and Kalamazoo.
Ar Chicago 2:15 P. M. at Michigan Central R. R. Station.
The Blackstone Hotel is about a 5 minute walk from the station of arrival and is suggested as headquarters.
Lv Chicago 9:00 P. M. New Union Station at Adams St.
Party will be in special sleeping cars through to Portland on the "North Coast Limited" via the Burlington Route to St. Paul and the Northern Pacific Railway. A luxurious observation car with shower baths, card rooms and plenty of big easy chairs. Extra high windows in this car enable the individual to see the best of our American western scenery.

July 6, Saturday.
Enroute through St. Paul and Minneapolis at 8:15 A. M. Thence into the great Minnesota Lake region. In the afternoon the train will be in the midst of the world's greatest grain growing state and in the evening will pass Bismarck, N. D., the state capitol.

July 7, Sunday.
Enroute through Eastern Montana, along the Yellowstone River into the American Rockies. Superb mountain scenery. Butte, the greatest mining city of all, is passed in the late afternoon.

July 8, Monday.
Enroute along the north bank of the Columbia River. Mt. Hood, one of the most inspiring sights of the Northwest, and Mt. St. Helens, Oregon's most beautiful mountain are visible the entire morning from our train.
Ar Portland 11:00 A. M.

Eighth to twelfth inclusive at annual meeting

Optional going route for members who wish to visit Yellowstone Park. The Yellowstone party and those going direct will join in Montana and travel together the balance of the trip.

The Yellowstone trip has been arranged to include the famous Cody Road, the Grand Canyon of Yellowstone, Yellowstone Lake, Old Faithful and Mammoth Hot Springs.

June 29, Saturday.
Lv Boston 9:30 A. M. B. & A. R.R. "North Shore Limited" South Station.
Lv Worcester 10:40 A. M.
Lv Springfield 12:05 Noon.
Lv Pittsfield 1:52 P. M.

June 30, Sunday.
Ar Chicago 8:00 A. M. M. C. R.R.
Lv Chicago 10:35 A. M. New Union Station Yellowstone "Comet" along the Mississippi River for 300 miles, Twin Cities in evening. Burlington Route to St. Paul, thence Northern Pacific Railway.

July 1, Monday
Enroute through the famous Bad Lands of North Dakota and immense farms of greatest grain district in world.

July 2, Tuesday
Ar Cody, Wyo. 7:15 A. M. No. Pac. & C. B. & Q.
Cody is the eastern entrance to Yellowstone. Following breakfast at Cody Inn, party will start at 9:20 A. M. on motor trip over the famous Cody Road. Evening at Grand Canyon Hotel.

July 3, Wednesday
Lv Grand Canyon 8:30 A. M. Motor.
Via greatest geyser region in the world to Old Faithful Inn. Afternoon and night at Old Faithful Inn, within a few yards of Old Faithful Geyser, which erupts regularly every 69 minutes.

July 4, Thursday
Lv Old Faithful 1:50 P. M. Motor.
Via the Paint Pots and shores of Yellowstone Lake to Lake Hotel. (Yellowstone Lake is at an elevation of 7,741 feet, the second highest lake in

the world). Across the Lake are the scenic Teton Mountains. Independence Day entertainment.

July 5, Friday.

Lv Yellowstone Lake 10:00 A. M. Motor.

Arriving Grand Canyon at Noon. The glories of the Great Fall and beauty of the Canyon are indescribable. Balance of day and evening at Canyon Hotel.

July 6, Saturday.

Lv Grand Canyon 1:35 P. M. Motor.

Through Dunraven Pass, where a marvelous view of the whole Park is obtained, and by Camp Roosevelt to Mammoth Hot Springs Hotel. Dinner here and after seeing the colored terraces, leave at 6:30 P. M. and motor through Yankee Jim Canyon to Gardiner.

Lv Gardiner 7:30 P. M. No. Pac. Ry.

July 7, Sunday

Enroute on Northern Pacific through the finest scenery in the Montana Rockies.

July 8, Monday

Ar Portland, Oregon 11:00 A. M. S. P. S. Ry.

Eighth to twelfth inclusive in attendance at annual meeting

July 12, Friday.

Lv Portland 11:30 P. M. Northern Pacific Ry.

Special sleeping cars will be ready at 9:30 P. M. for those wishing to retire early (Note) Those wishing to spend a little extra time in Seattle could leave Portland at 8:35 A. M. July 12th, reaching Seattle at 2:45 P. M. and join main party next morning.

July 13, Saturday.

Ar Seattle 6:30 A. M. No. Pac. Ry.

Lv Seattle 9:00 A. M. Can. Pac. S.S. Co. (Can. Pac. Docks).

Forenoon ride across Puget Sound. Noon stop at Victoria, B. C. There is time for short ride about the city, if desired. Vancouver at 5:45 P. M.

Lv Vancouver 7:00 P. M. Can. Pac.

July 14, Sunday.

Daylight ride through the heart of Canadian Rockies. Spectacular mountain scenery, through Revelstoke, Field, Kicking Horse Canyon. Open observation cars throughout.

Ar Lake Louise 5:10 P. M. Can. Pac.

Rooms at the Chateau Lake Louise, overlooking Lake Louise and its exquisite coloring.

July 15, Monday.

Lv Lake Louise 8:05 P. M. Can. Pac.

Ar Banff 9:30 P. M. Can. Pac.

Optional trip by motor to Banff in afternoon at cost of $5.00 person.

Rooms at Banff Springs Hotel.

July 16, Tuesday.

Banff lies in the midst of pine forests. The surrounding mountains make a perfect background. Many points of special interest are visible.

Lv Banff 6:25 P. M. Can. Pac. Ry.

July 17, Wednesday.

Enroute across Saskatchewan and into North Dakota.

July 18, Thursday.

Enroute across Wisconsin.

Ar. Chicago 9:15 P. M. Soo Line (Union Station).

Party will detrain and spend evening at hotel.

July 19, Friday.

Lv Chicago 11:00 A. M. Michigan Cen. R.R. Michigan Cen. Station.

July 20, Saturday.

Ar Boston 11:00 A. M. (E. S. T.) South Station. Boston & Albany R.R.

All time shown above is Standard Time

COST OF TRIP

Members of the party will purchase in advance only round trip railroad ticket and Pullman sleeping car tickets. The round trip rail fare from Boston will be $145.40. Lower berth for complete trip $69.01. Upper berth $55.20.

Those making the Yellowstone trip will have the following fare from Boston of $203.32 which includes the round trip rail ticket and complete 5 day trip in Yellowstone Park, and expenses at hotels. Lower berth for complete trip via Yellowstone $71.63, upper $57.30.

Proportionate fares from other New England points.

An estimated total cost of entire trip from Boston and back to Boston would be about $395.00; this includes everything. Rail ticket and Pullman berth, however, are all that will be purchased before leaving. For those visiting Yellowstone on preceding schedule, an additional cost of about $60.00. These estimates are based on the use of a lower berth in sleeping car and ½ double room with bath at all hotels.

RESERVATIONS

Members of the A. M. A. may make reservations through the following:

Headquarters, Massachusetts Medical Society, 126 Massachusetts Avenue, Boston, Mass.

Boston & Albany R.R., 67 Franklin Street, Boston, Mass., or W. A. Barrows, General Passenger Agent, South Station, Boston, Mass.

C. B. & Q. R.R., 294 Washington Street, Boston (Old South Bldg.).

Northern Pacific Ry., 294 Washington Street, Boston (236 Old South Bldg.).

When making reservations, please advise sleeping car space desired, i. e., lower, upper, section or room, and whether you will join the Yellowstone Party or go direct. At the time of making reservations, please state type of hotel accommodations preferred at places other than Portland. (Reservations at hotels in Portland to be made individually.)

BAGGAGE

Baggage allowance of 150 pounds on each full fare ticket. Hand baggage only allowed in Yellowstone Park; other baggage checked through without extra charge.

INSTRUCTIVE CARDS ON PREVENTIVE MEDICINE

The Massachusetts Department of Public Health have for general distribution cards of which a copy appears below.

Physicians should keep a supply for distribution as occasion requires. Apply to the State Department of Public Health, State House, Boston.

Commonwealth of Massachusetts
Department of Public Health

Preventive Medicine from Your Family Physician

There are at least three common diseases that can be prevented. Any case of these diseases in your family means that available methods have not been used.

(1) Smallpox may be prevented through vaccination. Recently smallpox has been widely spread over the country and in some places it has been of the malignant type.

(2) Typhoid fever may be prevented through the periodic injection of typhoid vaccine. "Vacation" typhoid is mounting with the increased crowding of the country.

(3) Diphtheria can be prevented in all your family. Your private physician will explain how.

Periodic health examinations at all ages may save you from diseases of middle life due to "wear and tear," such as Bright's disease, hardening of the arteries, cancer, and diabetes. These diseases are increasing and can be combated by corrected habits and early recognition.

Talk these matters over with your physician.

MASSACHUSETTS TUBERCULOSIS LEAGUE

1928-29

I

The President's Address

BY FREDERICK T. LORD, M.D.

We are now concluding the fifteenth year of the work of the State League which through the promotion of education in matters pertaining to Tuberculosis and the organization and support of preventive measures has played an important part in the significant reduction in the mortality from the disease in Massachusetts.

The amount of work accomplished during the past year exceeds that of any previous year. Much credit is due our efficient and industrious Executive Secretary for the satisfactory manner in which our activities have been conducted; the harmony which prevails in the League's affairs and in our relations with affiliated organizations. The League Staff personnel remains the same with the exception that Miss Jean V. Latimer has succeeded Miss Anna W. Johnson as Educational Secretary. Miss Latimer has carried on the work with much energy and a spirit which reminds us of her esteemed predecessor.

We note with deep regret the loss to the League of the services of Dr. Kendall Emerson, President from 1925-1928, of exceptional executive ability and familiarity with the problems of the League. Dr. Emerson resigned to become Managing Director of the National Tuberculosis Association. Fortunately in this capacity his services are still available in the cause of Tuberculosis.

It is with deep regret, also, that the Executive Committee is soon to lose the services of Dr. Henry D. Chadwick who has made notable contributions in the difficult field of Tuberculosis in children. Dr. Chadwick leaves to become Director of the Division of Tuberculosis of the Department of Health of the City of Detroit.

Mr. William N. Goodell, a Director of the League and Treasurer of the Lowell Tuberculosis Council has been elected to the Executive Committee to succeed Dr. Emerson.

It does not devolve on me to lay before you in detail the activities of the League during the past year. The educational secretary and executive secretary will later report the work in their respective fields. I may say that in the matter of adjustment of your acting President to his office they have both been most helpful.

There are certain matters to which I should like to refer as a report of progress. Of the success of the Christmas Seal Sale for 1928 you already know. In spite of a falling off of the sale in the United States as a whole, the return in Massachusetts exceeded that of previous years and reached a total of $261,000. Massachusetts, thus, maintains its position among the first ten states of the Union in the per capita sale of Christmas seals.

Since the last annual meeting, the Governor of the Commonwealth has signed the Bill introduced at the instance of the League into the General Court enabling County Commissioners to appropriate up to $3000 in support of Summer Health Camps or Preventoria. Several of the Counties have, in consequence, appropriated sums up to $3000 for the maintenance of children at the camps of our affiliated organizations.

During the year a rival sale of Christmas seals was inaugurated by the American Society for the Control of Cancer. Through mutual understanding between the National Tuberculosis Association and the Cancer Society the cancer seal sale, at least for 1929, has been abandoned.

The League has during the year maintained harmonious and mutually helpful relations with the State Department of Public Health and has benefited by the presence of the Commissioner, himself, or his representative at the meetings of the Executive Committee. The League participated actively in the early diagnosis campaign in April under the leadership of the National Tuberculosis Association. It has continued to co-öperate with the Massachusetts Central Health Council, with local Boards of Health and with private organizations, notably the State Mental Hygiene Society and the Council of Social Agencies.

In addition, I should like to call your attention to certain matters pertaining to the problem of tuberculosis prevention.

The mortality from Tuberculosis has diminished by more than a half during the twenty-five years which have elapsed since the beginning in 1904 of the activities of the National Tuberculosis Association. Throughout the period little has been known of the trend of the incidence of infection. Valuable information regarding this matter has now been obtained by Dr. Chadwick and his associates in their study of children under the Ten Year Program of the State Department of Health of Massachusetts.

Our knowledge of the incidence of tuberculous infection in childhood is based upon skin tests with tuberculin. Von Pirquet in 1909 in 1407 children in Vienna, among the poorer classes, found 5 per cent of reactors in the first year, with a rapid increase to 40% in the fifth, 80% in the tenth and over 90%

in the fourteenth year. The findings by other European investigators were essentially the same. A similar study was made by Bartlett in 1917 in Framingham, Mass. Of 460 children between the ages of one and seven and at an average age of 4.7 years 154 (33.4%) showed positive tests. The percentage at the different ages corresponded very closely with those obtained by Von Pirquet, and reached 54 per cent at 6 to 7 years.

Chadwick and Zacks report their findings as the result of the examination of 42,071 children during a period of three years. The percentage of reactors shows a gradual upward trend from 21% of infections at the age of five, 28% at ten to 35% at fifteen, the average for the whole group being 28%. Comparison of Chadwick and Zacks figures with the findings by Von Pirquet in 1909 suggests that the proportion of infected children is much smaller now than twenty years ago. There was almost universal acquisition of tuberculous infection by the fourteenth year then and only about one-third of children at fifteen are now found to be infected. The two groups are not strictly comparable, however, and the question can be raised whether tuberculous infection in children from the poorer classes in the cities of Europe prevailed to a greater extent than in these countries at large and in more random samples of the child population in America. In answer to this question, so far as Massachusetts is concerned, it is fortunate that a comparison can be made between Bartlett's figures for Framingham in 1917 and Chadwick and Zack's recent findings. By the testing of 520 children from three to fifteen years of age and at an average age of 10.4 years in Framingham in 1926, 129 (24.8%) were found to react. Among 62 children at the age of 6 to 7, 16 (25.8%) reacted. In making the comparison it is to be appreciated that there is a difference of about six years in the average age in the two groups of children and the reduction in the proportion of those infected is in consequence to be regarded as striking and significant. The findings may be taken to indicate that there has been a marked reduction in tuberculous infection in Framingham after nine years of intensive anti-tuberculosis and health work. There appears also to be a falling off in the incidence from almost universal infection at 14 in the European children, 20 years ago, to only about one third in the children of the State of Massachusetts at present. While such a comparison is open to objections, the downward trend of infection is not out of accord with what may be expected from the substantial reduction in the death rate from tuberculosis which has taken place during the interval. The death rate from all forms of tuberculosis in Massachusetts declined from 144 per 100,000 in 1917 to 73 in 1927. The conclusion that there has been a decline in infection may with certain reservations be regarded as valid. In any event, valuable information has been obtained regarding the incidence of tuberculous infection in a large series of children in the State of Massachusetts and this will serve as an important basis for comparison for this and other communities in later studies of this matter. The reduction is not only a source of great satisfaction, but an added incentive to proceed with renewed vigor in the campaign of prevention. Fewer infected children means a diminished source of supply of tubercle bacilli for the spread of the disease.

Intimate family exposure is far more serious early than later in life and a large proportion of the offspring of tuberculous parents develop manifest and fatal disease when the infection takes place during the first year of life. The mortality for infants infected during the first year ranges between about 40 to 90 per cent. The high incidence of tuberculous infection among children intimately exposed to the disease in the family is well known from investigations conducted soon after the discovery of the Von Pirquet skin test. It is uncommon for children to escape infection in families where one or both parents have active tuberculosis or have recently died. Chadwick and Zacks' investigation deals with children from five to fifteen years of age. Of 36,340 non-contact cases 8,831 (24.3%) reacted while 5,731 contact cases 2,910 (50.7%) reacted. Their study shows that approximately twice the number of children react to the tuberculin test when there is a history of exposure to a case of pulmonary tuberculosis.

The importance of contact is clearly evident in all such investigations. Contact is to be regarded as a chief factor in giving rise to infection. Other sources are of less importance. Among them infection from cattle is a matter of chief concern. Our activities in the field of prevention should be largely devoted to the prevention of contact infection. The early diagnosis of tuberculosis, early notification, the isolation and segregation of patients with open stages and the improvement of housing conditions are of paramount importance. In this state the large number of infected cattle is a serious problem and merits renewed effort to lessen the danger from this source.

TRACHOMA PREVENTION WORK OF THE PUBLIC HEALTH SERVICE

The United States Public Health Service has for several years carried out a program of maintaining small hospitals for the treatment of trachoma, located at strategic points in the affected area.

At present trachoma hospitals are being conducted in Kentucky, Tennessee, and Missouri, with the financial and moral co-öperation of those States.

In many localities the trachoma work conducted by the Public Health Service has given the people their first view of public health work of any sort and their first idea of the possibility of disease prevention.

It is easier for State health authorities to persuade a country to install a full- time health department if energetic trachoma eradicative measures have been undertaken in that county. Conversely, it is possible to do much more effective trachoma prevention work with the assistance of a well-organized county health department, especially when the State health department is manifesting an active interest in the campaign.

Evidence which has accumulated as the work has progressed indicates that Missouri and Arkansas probably have as much trachoma as Kentucky had when the work began, and that it exists to a dangerous extent in several other States. It is not uniformly prevalent throughout any State; some communities are heavily infected, while others are relatively or completely free from it.

Resurveys conducted from time to time show the beneficial effect of this trachoma eradicative work.

In certain areas trachoma is about to become a thing of the past as a result of the work done in those areas within recent years.

The trachoma hospitals maintained by the Public Health Service have a fourfold function. First, the clinical treatment of trachoma for the purpose of preventing damage to sight and stopping the patient from being a spreader of the disease. Second, a study of the disease itself. The physicians engaged in this work are constantly on the alert for improved methods of diagnosis and treatment. Third, education of patients in personal hygiene and disease prevention. Fourth, the trachoma hospitals are centers for operations directed toward the eradication of this disease.

Certain counties have become almost trachoma free, but in others the spread of the disease seems not to have ceased. The trachoma hospital of the Public Health Service located at Richmond, Kentucky, makes trachoma treatment available to an enormous area in eastern Kentucky where trachoma is still quite prevalent. This hospital is well equipped and can care for about 30 patients. On the day the hospital was opened a man was admitted who had been unable to work for three years on account of defective vision from trachoma. He had a wife and four children, the youngest of whom he had never seen. He was led into the hospital by a friend, and was for all practical purposes completely blind. After three months treatment he returned home with good working vision and when last heard from was earning $100 per week as an expert machinist. This illustrates not only the humanitarian but the economic value of this work. While this is one of the more spectacular cases, many have been restored to economic usefulness to an extent that was surprising both to the patients and their families.

The records show that in the State of Missouri, which has a Blind Pension Law, 3,152 pensions were operative during one year at a cost to the State of $200,000. Of these pensioners 637, or 20.2 per cent were blind because of trachoma. The cost of this disease in pensions alone in Missouri was, therefore, more than $40,000 in a single year.

The disease is not "catching" in the same way as are measles or mumps, but it is frequently due to some of the material from a "sore eye" getting into a healthy eye. This can occur in may ways, such as by the use of common basins, handkerchiefs, bedclothes, or towels. The use of the same towel by more than one person is one of the easiest ways to convey the infection, and many cases of "granulated eyelids" among the mountain people are probably caused by the common family towel.

Children at school may also convey the disease to others by exchanging or using the same pencils, slates, and cloths, or in playing games by blindfolding with cloths, fingers, etc. As the disease feels like a cinder in the eye, a friend may try to remove it and neglect to wash his hands before rubbing his own eyes. In fact, the disease can be contracted in any manner which serves as a means of conveying infected discharges from a diseased to a healthy eye.

When trachoma begins, the eyes feel as though a cinder, corn silk, sand, dirt, sawdust, or other substance had gotten into them, and usually some of these things are blamed for the eyes getting sore. The eyes soon become red and painful and discharge water. Some pus (matter) is present, and the eyelashes stick together in the mornings. Soon the light affects the eyes and in time causes so much pain that it is necessary to wear dark glasses or to tie a dark cloth over the head in the effort to keep out the light.

The inner surface of the eyelids becomes rough, somewhat like sandpaper, and irritates the eyeball during every wink of the eye, often described as "cutting".

It is this constant irritation that causes the eyeball to become red and painful. Ulcers appear, and a new growth is formed over the pupil, and then the patient is likely slowly to become blind. While the redness, pain, and discharges may cease for a time, the disease is almost sure to return unless treated. —*United States Public Health Service.*

THE THOMAS WILLIAM SALMON MEMORIAL

Hon. George W. Wickersham announces the establishment of the Thomas William Salmon Memorial to provide recognition to the scientist who has made the greatest contribution in the fight against mental disease during each year. Awards are to be National and International and will provide for the wider dissemination of the knowledge of mental hygiene and insanity through co-öperation with the New York Academy of Medicine, in whose hands the administration of the $100,000 fund is to be placed.

For the first time national and international recognition is to be given to the scientist who makes the greatest outstanding contribution of the year in the field of mental medicine. Announcement was made recently by the Hon. George W. Wickersham, as Honorary Chairman, of the establishment of the Thomas William Salmon Memorial to accomplish these purposes, in honor of the late Dr. Thomas W. Salmon, former Professor of Psychiatry of Columbia University and Medical Director of the National Committee for Mental Hygiene.

"The plan provides for a series of lectures to be given in various cities in the United States under the auspices of accredited scientific, medical or educational organizations. Provision will also be made for the publication and distribution of the lectures from year to year in order to make possible the maximum use of scientific knowledge which is being gained annually through the expenditure of millions of dollars on research and study in the field of psychiatry and mental hygiene by state departments, universities, foundations and individuals, which is now lost or obscure and not made available as readily and quickly as it should," said Dr. William L. Russell, Professor of Psychiatry of Cornell University, and Vice-Chairman of the Memorial Committee.

"The Memorial provides freedom from academic or institutional restriction of any kind and is intended to stimulate unrestrained research, study and expression of opinion and is calculated in the shortest possible time to disseminate knowledge of value in the control and prevention of mental and nervous diseases, one of the greatest public health problems of the present day."

The administration of the Memorial fund is to be vested in the New York Academy of Medicine, one of the leading medical organizations of the country since 1847, with a distinguished membership. It is a permanent and endowed establishment with national and international connections.

Universities, medical schools, scientific societies, hospital services, and independent workers in this country and abroad are to be surveyed annually in a search for the worker, prominent or obscure, whose original work promises most in the line of relief to the states, municipalities, private organizations and individuals confronting the economic and humane problems incident to the rapidly increasing number of people suffering from mental and nervous diseases. In this connection statement was made by Dr. Russell that more hospital beds in the United States were being occupied by mental patients than by all other diseases combined.

The initial $100,000 for the establishment of the Memorial to Dr. Salmon is being contributed by his friends, associates and laymen actively interested in the fields of mental and nervous diseases. The Honorary Vice-Chairman of the Memorial are: General John J. Pershing, Dr. Nicholas Murray Butler, Rev. Harry Emerson Fosdick, D. D., Mrs. Helen Hartley Jenkins and Dr. John H. Finley. The movement was initiated by a hundred and fifty of the leading neurologists and psychiatrists of this country who have associated with them, leaders in the mental hygiene movement and in psychiatric social service and nursing fields.

CORRESPONDENCE

THE APPOINTMENT OF DR. CARL H. ERNLUND

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

April 30, 1929.

NEW ENGLAND JOURNAL OF MEDICINE:

May I announce through your columns the appointment of Dr. Carl H. Ernlund as Visiting Laryngologist at the Pondville Hospital. Dr. Ernlund is Clinical Assistant at the Massachusetts Charitable Eye and Ear Infirmary, and Assistant Laryngologist at the Palmer Memorial Hospital and the Huntington Memorial Hospital. He has for some time been Assistant Visiting Laryngologist at the Pondville Hospital and has given excellent service. This appointment will give promise of continuing the astonishingly high quality of service given our entire visiting staff.

Yours truly,
GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

THOUGHTS CONCERNING THOSE SUFFERERS FROM HERNIA WHO ARE, FOR ONE REASON OR ANOTHER, INOPERABLE AND MUST, THEREFORE RESORT TO TRUSSES

To the Editor of the NEW ENGLAND MEDICAL JOURNAL:

Many medical journals of the period of 1891 carried articles bringing to the attention of the medical profession what was then a new principle of holding a rupture with a truss, by closing primarily the internal ring, through which a rupture descends, and not, as had always been done before, concentrating the pressure upon the external opening, or ring.

Every anatomist of that time, to whom this principle was shown, immediately became enthusiastic, and there was then developed the type of truss which has been called the "Frame Truss," which has proved successful in the hands of skilled fitters.

Since then, the advance of surgery has, to a considerable extent, displaced artificial supports of all makes, and those who have availed themselves of the better way have had reasons for rejoicing, and rightfully so.

Nevertheless, as matters now stand, about seventy-five per cent. of sufferers from hernia either cannot, or will not, for one reason or another resort to surgery and will take the risk of seeking artificial supports for themselves, in the majority of cases, to their own injury.

In many cases patients take this into their own hands, as it is often obvious that the physician has not sufficient knowledge for their guidance. There are medical schools where the matter of the truss is taught as thoroughly as the surgical side of hernia treatment, but that does not obtain in this section.

It is therefore timely that the subject of the truss be again brought forward, with a view to calling the attention of the medical profession to a few facts, which text books on surgery refer to superficially, and thus help to better equip physicians in dealing with hernias.

They should be shown that whereas the old idea has always been that a truss should make an upward pressure, it may be easily demonstrated that, to hold a rupture firmly and comfortably, it is necessary that the pressure applied by the retaining pad should be directly back-horizontal, and often inclining downward.

To put a rupture back into the body it has to be lifted, but once it is returned to where it belongs, the pressure must be backward, or even somewhat downward, to keep it safely in place.

To accomplish this direction of pressure the "Frame Truss" was designed, and the results obtained were beyond the expectations of its designer, an anatomist and surgeon.

A text book dealing with the truss treatment of hernia should therefore emphasize the "Frame Truss" as being the best, and not merely state, as a very recent publication had it, "probably" the best.

The young graduate should also have pointed out to him the different models of trusses, their construction, and whys and wherefores of one type over another, why a pad should be large on top, and small on the bottom, rather than just the opposite, as most of them are. In order to close the "internal ring" it is necessary that the largest or fullest part of the pad should be uppermost. Both ways cannot be right, therefore the complete closure of the inguinal canal is involved when one way is used, whereas a partial closing occurs, with the other.

The right kind of a "Frame Truss" should be made of rustless, malleable metal, that it may be easily shaped to the body, and the principle of the triangle should be used, with two thin leather straps, rather than two hard pads, pressing into back; to prevent the tilting of the truss, understraps should be entirely avoided and the elastic truss should be discarded as ineffective, unsanitary and uneconomical.

By making truss frames of metal that allow bending and shaping, all adjustments, such as producing more or less pressure, adapting to fat or thin persons, fitting angular people, tall people with deep pelvic bones, and short people with shallow ones, in fact, every adjustment that the most complicated, as well as the simplest cases can require is readily obtained by the simple means of bending the spring or frame, and when the adjustment is thus properly

made, it will always stay in place and allow a fitting of the truss to the body, that makes the instrument entirely invisible under the clothing.

Dealing in and fitting of trusses should be restricted and regulated, since too many irresponsible people with little experience and not even rudimentary knowledge of regional anatomy are working much havoc, where real service should be rendered. Such restrictions and regulations would at least serve the useful purpose of putting thousands of antiquated models of trusses into the discard, the fittest only would then survive. There are really only three worth while models of trusses, and these should receive the intelligent specification of the medical profession.

Very truly yours,

E. S. GARLAND.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

In addition to the articles enumerated in our letter of March 30, the following have been accepted:

Abbott Laboratories
- Bismarsen

Ciba Co., Inc.
- Digifoline—Ciba
  - Digifoline—Ciba Liquid
  - Ampules Digifoline—Ciba Solution, 1 cc.
  - Ampules Digifoline—Ciba Solution, 5 cc.
  - Tablets Digifoline—Ciba

Parke, Davis & Co.
- Diphtheria Toxoid

E. R. Squibb & Sons
- Insulin—Squibb, 80 units, 10 cc.

Winthrop Chemical Co., Inc.
- Tablets Theocin Soluble, 2½ grains

W. A. PUCKNER, *Secretary*,
Council on Pharmacy and Chemistry.

RECENT DEATH

CLAPP—DR. HERBERT CODMAN CLAPP, formerly professor of diseases of the chest in Boston University School of Medicine, died in Boston, April 30, 1929 at the age of 83.

He was born in Boston, January 31, 1846, the son of the late John C. and Lucy B. Clapp. He was prepared for college at the Roxbury Latin School and received his A.B. degree from Harvard in 1867 and three years later he was awarded his A.M. from the same college and his M.D. from the Harvard Medical School.

After his graduation, Dr. Clapp practised medicine in Boston until 1921, when he went to Brookline, where he continued to practice. In 1878, he was married to Mary O. Richardson of Brooklyn, N. Y., who survives him, as do three daughters.

For nine years after its opening in 1898, he was visiting physician to the Massachusetts State Sanatorium for Incipient Consumptives at Rutland, the first institution in this country to apply by means of public taxation, on a large scale, the modern curative methods of treating tuberculosis. Dr. Clapp did a great deal of pioneer work with this institution.

In addition to his practice Dr. Clapp was a member, former treasurer and former president of the Massachusetts Homeopathic Medical Society; a fellow of the Massachusetts Medical Society and the American Medical Association. Also, he was a charter member of the National Tuberculosis Association.

As an authority on chest and throat diseases, Dr. Clapp's book "Handbook of Auscultation and Percussion" reached its thirteenth edition. He was the author of "Is Consumption Contagious?" For Arndt's "System of Medicine," Dr. Clapp wrote the sections on physical diagnosis, phthisis pulmonalis and tuberculosis. From 1879 to 1881 he was the editor of the *New England Medical Gazette* and wrote numerous articles for various medical journals in all parts of this country.

NOTICE

REMOVAL OF OFFICE OF DR. FRANCIS P. McCARTHY

Dr. Francis P. McCarthy announces that he has taken over the office and practice of the late Dr. Townsend W. Thorndike at 371 Commonwealth Avenue, Boston, Mass.

REPORTS AND NOTICES OF MEETINGS

MASSACHUSETTS PSYCHIATRIC SOCIETY

A meeting of the Massachusetts Psychiatric Society was held at the Boston Psychopathic Hospital April 24, 1929.

Dr. William Malamud of the Foxboro State Hospital presented a paper entitled "The Relationship Between Clinical, Serological and Histological Observations in General Paralysis Treated with Malaria."

The pronounced variation in the clinical course of patients treated with malaria, and the lack of correlation between clinical outcome and serological changes following malarial treatment makes it imperative to look for some new reactions that would serve as guides in making the prognosis. A study of fifty-four cases of neurosyphilis treated with malaria, with serial examinations of the blood and cerebrospinal fluid at regular intervals, showed that there exists a definite correlation between the behavior of index of permeability of bromides and the clinical course. It was found that all untreated cases of general paresis had an increased permeability. This increase changed to normal in cases that afterwards showed a good clinical result. In patients where the malarial treatment was unsuccessful, the permeability index remained as before treatment. These changes in permeability preceded the clinical fluctuations and could, therefore, be used as indicators of the clinical outcome. All other serological tests that were studied proved to be unreliable as such indicators. A definite relationship between the permeability indexes and the iron reaction in the cortex was also found. This means that the permeability index can be utilized as a link between the clinical course and the actual histological occurrences in the brain.

Dr. Francis H. Sleeper of the Worcester State Hospital spoke on "Endocrine Study in Dementia Praecox at the Worcester State Hospital."

A method of procedure for the study of Endocrine conditions in mental cases based on the system of Endocrine diagnosis elaborated by A. W. Rowe of

Boston, in use at the Worcester State Hospital was described. In almost fifty per cent. of the Dementia Praecox cases, it was possible to make a tentative Endocrine diagnosis. Over half of the eighty cases studied showed an abnormal lowering of the Basal Metabolic rate; forty-eight per cent. of the cases showed lowering of the Galactose Tolerance; five cases showed a positive Urobilinogen test in the urine; during the study, a total of twenty-five others likewise showed Urobilinogen. The Bromsulphalein test as used at the Mayo Clinic was positive in twenty-eight and five tenths per cent. of the cases studied.

WINFRED OVERHOLSER, M.D., *Secretary.*

BRISTOL SOUTH DISTRICT MEDICAL SOCIETY

The annual meeting of the Bristol South District was held in the New Bedford Public Library, Thursday, May 2, at 5 P. M.

Dr. Arthur L. Chute of Boston spoke on "Urinary Stone, — its recognition and treatment." Lantern slides from a large number of x-ray plates supplemented Dr. Chute's paper.

The following officers were elected for the ensuing year:

President—Dr. G. L. Richards, Fall River.

Vice-President—Dr. William A. Nield, New Bedford.

Secretary-Treasurer—Dr. G. E. Borden, Fall River.

Censors—L. V. Merritt, Fall River; D. D. Pratt, New Bedford; F. M. Howes, New Bedford; D. P. O'Brien, New Bedford; W. F. MacKnight, Fall River.

Commissioner of Trials—A. C. Lewis, Fall River.

Councillors—E. F. Cody (Nominating), New Bedford; E. D. Gardner, New Bedford; R. Wood, New Bedford; H. E. Perry, New Bedford; I. N. Tilden, Mattapoisett; R. B. Butler (alternate), Fall River; S. V. Merritt, Fall River; D. J. Fennelly, Fall River; E. F. Curry, Fall River; J. A. Barre, Fall River.

At the close of the meeting dinner was served in the New Bedford Hotel.

GEORGE E. BORDEN, M.D., *Secretary.*

THE HARVARD MEDICAL SOCIETY

The Harvard Medical Society held a meeting in the Peter Bent Brigham Hospital Amphitheatre on Tuesday evening, April 23, 1929. Dr. Harvey Cushing presided. After the presentation of cases the Canti film showing tissue growth and the effect of radium emanations on the growth of cancer cells was thrown on the screen. This was made possible through the courtesy of the American Society for the Control of Cancer.

The first case was presented by Dr. Rennie of the medical service. The patient was a 65-year-old Irish-American woman who entered the hospital on April 17, 1929, complaining of inability to retain solid foods. This had begun 13-14 months before with slight regurgitation which increased so that soon she regurgitated all solids immediately after swallowing. This was accompanied by an uncomfortable feeling and choking. There was no blood in the vomitus. Her past history was negative except for slight indigestion and ten pounds loss in weight. Physical examination showed a well developed and nourished women, but was essentially negative. The blood pressure was 160/88. The admission diagnosis was carcinoma of the oesophagus, but oesophagoscopy revealed only a hypertrophied, polypoid mucosa which bled freely on manipulation. In the discussion of the case Drs. Murphy and Homans suggested that ulcer of the oesophagus might be a better diagnosis.

The second case was presented by Dr. Bowen of the surgical service. The patient was a 47-year-old railroad worker who came into the hospital with the complaint of haematuria of three months' duration. His past history was unimportant except for some abscesses in his scrotum eleven years ago. Five weeks before admission he began to have frequency, dysuria, and nocturia. Three weeks before admission he had a 24-hour period of total haematuria with the passage of some blood clots. He was admitted with the diagnosis of tumor of the bladder. There was nothing abnormal in the physical examination except for the scrotal scars and a slightly enlarged, tender prostate. The urine contained a single plus albumen and was microscopically bloody. Cystoscopic examination showed a large mass in the dome of the bladder which had the appearance of a carcinoma. On operation about a third of the bladder was removed and quite a bit of the tissue towards the umbilicus because it seemed infiltrated. The pathological report was a tuberculoma, which is a rare lesion. Thirty-six hours after the operation the patient began to have dyspnea and some cyanosis. Chest examination showed almost flatness below the 4th rib on the right. Breath sounds there were tubular and almost absent. X-ray showed massive collapse of the lung. The patient recovered from that under appropriate treatment and was convalescing well.

Before the film was presented Dr. Bulkley told about it. Dr. Canti, who does his work at Cambridge, England and at the Strangeway's Research Hospital, while working with tissue growths in vitro, thought he would like a permanent record of the activity of the cells. For normal tissue he used subcultures of periosteum taken from a fowl embryo; for tumor tissue he selected a bit of Jensen's rat sarcoma, which has been kept alive since its introduction by Jensen in 1903. He studied their normal growth of cells and the effect of radium emanations upon them. His first films were worthless because of the excessive vibration of the objects. Then, by a special grant of the Cancer Research Council, a concrete foundation was built and with a special support he produced the film presented.

The first reel consisted of pictures taken one every minute for 27 hours. It showed the normal growth of tissue cells at the edge of the explant by mitosis, while the cancer cells were much more active and grew much more swiftly. With a magnification of approximately 85,000 diameters it was shown that mitosis takes from eighteen minutes to two hours depending on the type of cell.

The second reel showed the effects of radiation on both the normal and tumor tissues. Small tubes containing seventy to one hundred and fifty millicuries of beta and gamma rays were placed from four to seven millimeters from the tissue. In the case of the normal tissue, within twenty minutes the wandering tissue cells were immobilized and killed, but the connective tissue cells were merely inhibited in their growth. In the tumor tissue not only were the wandering cells killed, but also the tumor cells were seen to undergo degeneration.

The third reel showed cell division under a higher power. All the mitosis changes were observed, and the movements of the mitochondria back and forth within the cell membrane noted quite clearly.

A more amazing film has scarcely been produced. It made the meeting one of the most interesting in the academic year.

ANNUAL MEETING OF THE SUFFOLK DISTRICT MEDICAL SOCIETY

The Annual Meeting of the Suffolk District Medical Society was held Wednesday evening, April 24, 1929, in John Ware Hall, Boston Medical Library, 8 The Fenway, Boston.

The meeting was called to order at 8:15 P. M. by Dr. Lincoln Davis, President. There were about 85 people present.

The minutes of the Stated Meeting were read and accepted.

A letter from Dr. Joseph H. Pratt on "The Problem of Securing Professional Service for a Clinic" was read.

The report of the Auditing Committee was read and accepted.

The amendment to the By-Laws was read and unanimously passed.

A Committee, composed of the following men, was appointed to revise the by-laws: Stephen Rushmore, M.D., Chairman; David Cheever, M. D., Leland S. McKittrick, M.D., Thomas J. O'Brien, M.D., Samuel N. Vose, M.D.

The report of the Nominating Committee was read and accepted.

Dr. Henry K. Pancoast, Professor of Roentgenology at the University of Pennsylvania, read a very interesting and conservative paper on "Radiation in Cancer." The discussion of this paper was opened by Dr. Robert B. Greenough.

The meeting adjourned at 10:30.

The following named officers were elected to serve during the ensuing year:

Lincoln Davis, M.D., President.
William H. Robey, M.D., Vice-President.
Leland S. McKittrick, M.D., Secretary.
John Rock, M.D., Treasurer.
Channing Frothingham, M.D., Commissioner of Trials.
David Cheever, M.D., Councillor for the Nominating Committee.
George S. Derby, Alternate.

Committee on Supervision: Frederick W. Stuart, M. D., James B. Ayer, M.D.

Committee on Social Meetings: Anna G. Richardson, M.D., Joseph A. Cogan, M.D., Wesley T. Lee, M. D., Frederick W. O'Brien, M.D.

Auditing Committee: William B. Breed, M.D., William P. Coues, M.D., William T. S. Thorndike, M. D.

Censors: Paul D. White, M.D., Robert C. Cochrane, M.D., George P. Denny, M.D., Francis W. Palfrey, M.D., Alonzo K. Paine, M.D.

Councillors: A. W. Allen, M.D., A. E. Austin, M.D., J. W. Bartol, M.D., G. H. Bigelow, M. D., H. Binney, M.D., W. B. Breed, M.D., J. L. Bremer, M.D., W. J. Brickley, M.D., J. E. Briggs, M.D., L. T. Brown, M.D., D. Cheever, M.D., A. L. Chute, M.D., R. C. Cochrane, M.D., F. J. Cotton, M.D., A. H. Crosbie, M.D., W. P. Cross, M.D., L. Davis, M.D., G. P. Denny, M.D., G. S. Derby, M.D., R. L. DeNormandie, M.D., W. H. Ensworth, M.D., R. B. Greenough, M.D., J. B. Hawes, 2nd, M.D., J. Hitchcock, M.D., J. Homans, M.D., E. P. Joslin, M.D., F. S. Kellogg, M.D., R. I. Lee, M.D., G. A. Leland, M.D., J. H. Means, M.D., R. Metcalf, M.D., L. S. McKittrick, M. D., M. Nigro, M.D., A. K. Paine, M.D., W. S. Parker, M.D., W. F. Regan, M.D., A. G. Richardson, M.D., G. C. Shattuck, M.D., W. R. Sisson, M.D., R. Soutter, M.D., J. S. Stone, M.D., G. L. Tobey, Jr., M.D., P. D. White, M.D., C. Wesselhoeft, M.D.

G. P. DENNY, M.D.
J. R. TORBET, M.D.
T. J. O'BRIEN, M.D.
S. RUSHMORE, M.D.
A. W. ALLEN, M.D.
Nominating Committee.

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

The seventieth annual meeting of the Worcester North District Medical Society was held at Burbank Hospital, Fitchburg, Tuesday, April 23, 1929.

The annual oration was given by C. H. Jennings. His subject was: "Some Causes for Gastro-Intestinal Symptoms."

Following is the result of the election of Officers:

President—F. R. Dame, Athol.
Vice-President—R. C. Jones, Fitchburg.
Secretary—C. H. Jennings, Fitchburg.
Treasurer—F. H. Thompson, Jr., Fitchburg.
Commissioner of Trials—A. F. Lowell, Gardner.

Censors—J. A. Barton, Supervisor, Fitchburg; George Mossman, Gardner; B. P. Sweeney, Leominster; F. H. Thompson, Jr., Fitchburg; C. H. Jennings, Fitchburg.

Councillors—J. A. Barton, Fitchburg; H. D. Bone, Gardner; W. E. Currier, Leominster; A. F. Lowell, Gardner.

Nominating Committee—J. A. Barton, Fitchburg; H. D. Bone, Gardner.

C. H. JENNINGS, *Secretary.*

STAFF MEETING OF THE MASSACHUSETTS HOMEOPATHIC HOSPITAL

The regular monthly meeting of the Staff of the Massachusetts Homeopathic Hospital was held at the Evans Memorial on Friday, April 26, 1929, at 8 P. M.

"A Case of Splenic Anemia with Splenectomy" was discussed clinically by Dr. Charles T. Howard, with pathological discussion by Dr. Charles F. Branch.

Moving pictures of Orthopedic conditions were shown by Dr. A. G. Howard.

Dr. Louis G. Howard presented a case of double clubbed hands and feet, congenital dislocation of the right hip and both knees. Treatment will be protracted and will consist of manipulation and spastic operations. He also exhibited a case of spina bifida with meningocele in a two day old infant.

Dr. S. C. Fuller demonstrated a case which had been diagnosed prior to entry into the Hospital as congenital absence of both external recti, manifested by inability to turn the eyes outward. Dr. Fuller considered this diagnosis as wrong and ascribed the condition to an old encephalitis or poliomyelitis affecting the midbrain and the nucleus of the sixth nerve.

Dr. Nathan H. Garrick reported a case of glioma of the Rolandic area.

SAMUEL N. VOSE, M.D., *Secretary.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The monthly clinical conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, on Thursday, May 16, at 8 p. m. The following cases will be reported:

Chronic Nephritis with Caseous Tuberculosis.

Pericarditis with Effusion.

Juanita P. Johns will speak on the work of an ophthalmological clinic.

ALICE H. BIGELOW, M.D., *Secretary.*

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

The annual meeting of the Middlesex North District Medical Society will be held on Wednesday, May 15th at the U. S. Veterans Hospital at Bedford, Mass. An elaborate program has been arranged.

T. A. STAMAS, *Secretary.*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Amphitheater of the Peter Bent Brigham Hospital on the evening of Tuesday, May 14, at 8:15 o'clock.

The program is as follows:

1 Presentation of cases.

2 "The Etiology of Puerperal Fever—Its Historical Development," by Dean Irving S. Cutter, M.D., of Northwestern University Medical School, Chicago.

SOCIETY MEETINGS

May 14—Harvard Medical Society. Detailed notice appears above.

May 16—New England Hospital for Women and Children. Complete notice appears above.

June 13—International Hospital Congress. Complete notice appears on page 212, issue of January 24.

July 8-9—American Association for the Study of Allergy. Complete notice appears on page 906, issue of April 25.

July 9—American Heart Association. Scientific Meeting from 2 to 6 P. M. in the Auditorium of the Woman's Club, 448 Taylor Street, between 12th and 13th Streets, Portland, Oregon.

October 7-19—New York Academy of Medicine. Detailed notice appears on page 468, issue of February 28.

DISTRICT MEDICAL SOCIETIES

Essex South District Medical Society

Tuesday, May 14, 1929—Annual Meeting. The Tavern, Gloucester. Speaker: Dr. O. F. Carr, Beverly, Trip around World, Illustrated. Ladies invited. Dancing.

Middlesex East District Medical Society

The following schedule has been arranged:

May—Melrose.

Subjects and speakers to be arranged by committees in each city or town.

Middlesex North District Medical Society

May 15—Complete notice appears above.

Norfolk District Medical Society

May 7—Annual Meeting. Detailed notice appears on page 958, issue of May 2.

BOOK REVIEWS

Treatment of Diabetes Mellitus by ELLIOTT P. JOSLIN, M.D. Fourth Edition, enlarged, revised and rewritten. Lea and Febiger, Philadelphia, 1928. 998 pages. Price $9.00.

Though some months have elapsed since its publication, Boston must not fail to acclaim the appearance of a new edition of Dr. Joslin's famous textbook on diabetes.

This new book is of necessity a large one. It is not a diabetic manual. It does not limit itself to the treatment of diabetes. But it covers thoroughly and scientifically the entire present-day knowledge of diabetes in order that it may serve as a reference book for general practitioner and diabetic specialist alike.

Its very size will discourage many men from looking into it. But the conclusions of this author, after the study of over 6,000 diabetics, are too important to the other 1,400,000 diabetics and potential diabetics in this country (p. 131) to be allowed to pass without emphasis. One may, therefore, rightly claim more space than is usually allotted to a book review.

Furthermore, this book covers not only the subject of diabetes, but much that concerns the general health of the nation as well since "a campaign for the prevention and treatment of diabetes should give the community a knowledge of diet, of the danger of obesity, and of the importance of physical exercise. The gain to the community from the dissemination of such knowledge will almost offset the harm caused by diabetes." (p. 139)

As is to be expected, the style of the book combines scientific accuracy and completeness with human interest in such a way that it is thoroughly readable. Summary sentences and telling epigram abound. It is, of course, true that unless conversant with diabetic theory and literature, one might find difficulty in getting through the sections on "Blood Lipids", and "The Total Metabolism of Diabetes", but anyone interested in medicine should not fail to read such sections as those on "The Diabetes of Today", "The Etiology of Diabetes", "The Depancreatized Dog", and "The Treatment of Diabetes in Childhood".

In reading such a book, one cannot help seeing the personality of the author through it all. There is, in the first place, evidence of indefatigable work. One wonders if a man who can compile such a treatise follows his own oft-repeated advice on the necessity of "mental relaxation and physical exercise". One almost shudders to read, "I spent the summer evenings of 1926, in personally recording the classification of each one of the diabetics I have seen since 1898," yet one envies him the joy which he got in this work and could hardly wish him at the movies instead.

Always one feels the intense human interest of the author and knows that while, for scientific reasons, his cases are numbered, yet case No. 1796 is not just a number but is really Louisa Drum who, on the day she was 79 years and 4 months old, learned to do the Benedict test in his office and tested the urines of ten people living in her boarding house and discovered the presence of diabetes in a boy. (p. 536)

Characteristic of the man is his eagerness to acknowledge help and to give credit wherever it is true in regard to his associates, medical students who have worked with him, and workers in other cities and fields, and comes out especially in a footnote in which he records that "a recent authority", Irving Bailey, aged 8 years, reports that in 16 oranges there were 10 sections, in 9 oranges 11 sections, and in one orange, 12 sections. (p. 504) In this way he, not only assigns credit, but also stimulates interest in reading and investigation, which is one of his greatest aims.

On the mechanical side, as one familiar with Dr. Joslin's methods would know, the book is perfect. There are no typographical errors and the references, one is safe in assuming, are absolutely correct. The index is a little inadequate at times, but what index is not?

What then are the conclusions of such a man after such a study of diabetes and especially after more than five years' experience with insulin? No one else can speak with such authority on the comparative results of treatment in the Naunym period, or that before 1914; the Allen period of undernutrition, June, 1914 to August, 1922; and the Banting epoch of insulin treatment from August, 1922. (p. 184) Let him, therefore, speak for himself.

Diabetic Creed (p. 561)

"I believe at the beginning of this year, 1928:

"1. That diabetes mellitus should be considered so probable in any person who has 0.1 per cent or more of sugar in the urine that he should be watched for life.

"2. That normal weight or less should be insisted upon in each diabetic, suspected diabetic, or relative of a diabetic, but that therapeutic loss of weight should be extremely gradual.

"3. That mildness of the diabetes should be assumed, a long life be expected, and the patient be treated accordingly. Hence, the nearer the proportions of carbohydrate, protein, and fat in the diabetic diet conform to those of the normal diet, always seeking to avoid glycosuria and hyperglycemia, the better it will be for the patient, even at the sacrifice of weight, though not of strength. A carbohydrate tolerance, unutilized, retrogrades.

"4. That reversal of the diet, namely high-fat and low-carbohydrate, assumes the contrary, severity of the diabetes, and is dangerous, both in principle and in practice and unless accompanied by a minimum protein intake frequently ends in coma.

"5. That undernutrition (a) prevents diabetes and (b) is the foundation-stone of diabetic treatment, but if hunger can be avoided a smaller number of patients will yield to temptation, break treatment, and in consequence die of coma.

"6. That extreme inanition with loss of body protein is not worth while simply to render the blood sugar normal.

"7. That diabetes of itself is not fatal, but that death ensues from other diseases or complications; that coma is an accident usually inexcusable and is more easily prevented in 99 cases than treated in 1, and, therefore, diabetics when ill from any cause should (1) go to bed, (2) keep warm, (3) take a glass of hot water, tea, broth, orange juice, or oatmeal water gruel every hour, (4) empty the bowels with an enema, (5) call a doctor, who, if he finds acidosis the dominant factor, will give insulin and caffeine, may wash out the stomach and inject subcutaneously a solution of salt. A diabetic under treatment with insulin should not omit it unless sugar-free and under medical supervision.

"8. That the diabetic should be regarded as unusually susceptible to arteriosclerosis and should be treated with this in view. The carbohydrate in the diet should not long remain under 100 grams and foods high in cholesterol should be restricted. Gangrene and the complications therefrom can usually be avoided by treatment with posture and by washing the feet daily and reporting the discovery of any lesion to the physician.

"9. That any patient with a tolerance of less than 100 grams of carbohydrate should (a) test his own urine for sugar, (b) keep sugar-free, and (c) take home food scales and use them until he can keep sugar-free without them.

"10. That the immediate aim of practice should be to simplify treatment and to encourage physicians to develop in their own communities, homes and clinics to which they may refer their patients for a diabetic education in case their own time and facilities are inadequate.

"11. That firm persistence in a strict diabetic diet (a) finds ample justification in the patients kept alive by it to profit by insulin; and (b) is essential to safety and success in the use of insulin. Insulin utilizes rather than replaces the advances in diabetic treatment hitherto achieved."

A wealth of experience and observation is concentrated in those eleven points, and one may be permitted to glean from other parts of the book material which amplifies certain of these points and helps in their practical application.

1. As to *diagnosis*. The figures show that about 69% of the cases have had no symptoms indicative of diabetes at the time sugar was first demonstrated in the urine. (p. 413)

The author's stand on the relative merits of examinations for glycosuria and hyperglycemia is summed up in the following sentences:

"I believe the fairest way in which to determine whether a patient has diabetes is to make the examination without previous notice after a dinner of meat, potato, 3 slices of bread, apple pie with coffee and sugar. The urine should be free from sugar before and 1, 1½, or 2 hours after the meal. If sugar-free, the evidence is probably about 99.9% correct that the patient has not diabetes but to be 100%, simultaneous tests for sugar in blood and urine should be performed." (p. 201) A diagnosis of diabetes is then probable if the blood sugar after a fast is 0.14% or above, and 1½ hours after the carbohydrate meal is 0.17% or above. (p. 193)

In general typical "sugar tolerance tests" are regarded as undesirable and, especially in the case of children, demoralizing, since "The child cannot reason why so much food of the character he enjoys should be good for him one day and not the next. New tests and treatment should be worked out upon adults. The colt needs a steady rein." (pp. 200 and 848)

"The importance of securing several (urine) specimens, particularly in doubtful cases cannot be overstressed." (p. 414)

In all cases, Dr. Joslin tries hard to make a satisfactory classification since "unclassified cases worry

the doctor, annoy the patient, and exasperate insurance agents." (p. 99)

2. As regards *etiology*, the author stresses throughout the book the great danger of obesity as a *cause* of diabetes and one is relieved to read in the latter part of the book this statement, "There is indication that overweight in and of itself is not the real factor which leads to the development of diabetes in the adult any more than overheight in and of itself leads to the development of diabetes in the young. Overweight and overheight must be secondary to other determining causes and one cannot help surmising that there must be a close interaction between the pancreas, gonads, thymus, and hypophysis and thyroid and adrenals." (p. 825) As for the reduction of obesity, Dr. Joslin find that "the fashion plate makers are so ahead of the insurance company presidents in their propaganda for normal weight." (p. 161)

The influence of heredity is still undertermined, though 21% of all the author's cases showed an "hereditary or familial tendency" (p. 143), and as regards prognosis, "I always look upon heredity as a favorable omen." (p. 146) "Diabetes is nearly twice and a half as common in this vicinity among Jews." (p. 151)

"In adults cholelithiasis is probably one of the most important etiological factors in diabetes mellitus." (p. 545)

3. As to *diet* in general,

"The whole aim of diabetic treatment is to protect the patient by promoting by every means in our power the combustion of carbohydrate and preventing the excessive and defective catabolism of fat." (p. 368)

One notes the repeated insistence that carbohydrate stimulates the pancreas (p. 204) and that it is not wise to omit all carbohydrate at any meal (p. 159), though one gives less at breakfast than later in the day (p. 210). It is interesting also to note that the fact is now generally accepted the carbohydrate can be produced from protein and fat and "one must not overlook the possibility of 58 gms. of carbohydrate being formed out of 100 gm. of protein and 10 gm. out of the glycerol in 100 gms. of fat" (p. 499). One must take this point into account in using the "diabetic foods" which are of such high protein value.

In so far as detail of diet are concerned, Dr. Joslin feels that an ideal diabetic diet would contain for each kilogram of body weight 1.5 gms. carbohydrate, 1.25 gms. protein, and 2.0 gms. fat or 29 calories per kilo. (p. 590)

4. and 8. The danger of the *high fat* diet is further summarized in this sentence, "With an excess of fat, diabetes begins and from an excess of fat, diabetics die, formerly of coma, recently of arteriosclerosis." (p. 685) (Approximately one-half of those who have diabetes suffer with and ultimately succumb to arteriosclerosis. p. 18)

7. In the treatment of coma, Dr. Joslin's position has not changed from that held in previous editions of the book. He still feels that one should treat the disease diabetes and not the symptom acidosis. (p. 660) "Sodium bicarbonate was abandoned in Sept. 1915, and has never been resumed." (p. 258)

11. *Insulin.* Who should take it and in what amount? "Any diabetic who cannot keep the urine free from sugar and the sugar in the blood normal and himself in good health with diet alone, should take insulin." (p. 68) The author is using slightly larger doses of insulin than five years ago (p. 75), but still feels that "with larger doses of insulin, the patient is walking on longer insulin stilts and that his equilibrium is therefore correspondingly endangered." (p. 74) "The longer the stilts, the greater the danger of a fall when they are taken away. In this diabetic game, one is treating patients for years and the closer one keeps to the ground the better." (p. 94) And to quote further, "Insulin is allowing us to find out what sort of diet and what conditions of life are best for the diabetic. It is not at all inconceivable that eventually the application of this knowledge will yield such large returns as to make insulin itself unnecessary." (p. 107) In this latter connection, it is also noteworthy that "the clinical evidence of regeneration of the pancreas if growing" (p. 22) but, " 'once a diabetic, always a diabetic', I believe is the last rule to stick to, no matter how much improvement." (p. 186) "Cured" cases of diabetes are usually found to be of pituitary origin. (p. 874)

Diet and insulin alone do not satisfy Dr. Joslin and he feels that all young diabetics as well as the "ten scarred insulin veterans" should have the "best armor modern hygiene affords. This includes treatment of teeth, tonsils, postural training, protection against smallpox, tuberculosis, diphtheria, scarlet fever, and minor infections, whether general or local, and always adequate sunlight, hours of rest, and hours of play." (p. 852) Regarding "play", one must remember that over-exercise, as well as an overdose of insulin may give hypoglycemia. (p. 220)

In relation to complicating disease, we find this striking sentence, "When the diabetes is doing well and the patient doing poorly, suspect tuberculosis; when the diabetes is doing poorly and neglect of treatment is not the obvious cause, suspect cancer of the pancreas, hyperthyroidism, or latent suppuration and, more rarely, tuberculosis." (p. 745)

Any survey of this most important work is inadequate. A study of the book itself will more than repay any reader. But to attempt a summary seemed better at this time than to try to evaluate contested points.

Medical Information in Sickness and Health. By PHILIP SKRAINKA, M.D. Coward-McCann, Inc. New York. 1929. Pp. 560.

In any book written by a physician for lay readers it is possible for a reviewer to find subjects treated in ways that he probably would not use himself. However, this book may be recommended as a hybrid between the encyclopedia of household lore of the past generation and the attempts at painlessly and not too specifically educating the public in medical matters in vogue today. It is rather disappointing under diabetes to find only a parenthetical clause dealing with insulin.

The choice of paper by the publishers has resulted in a very bulky and inconvenient volume to handle, but possibly the inconvenience will be offset by the ponderous impression made on the seeker after medical knowledge.